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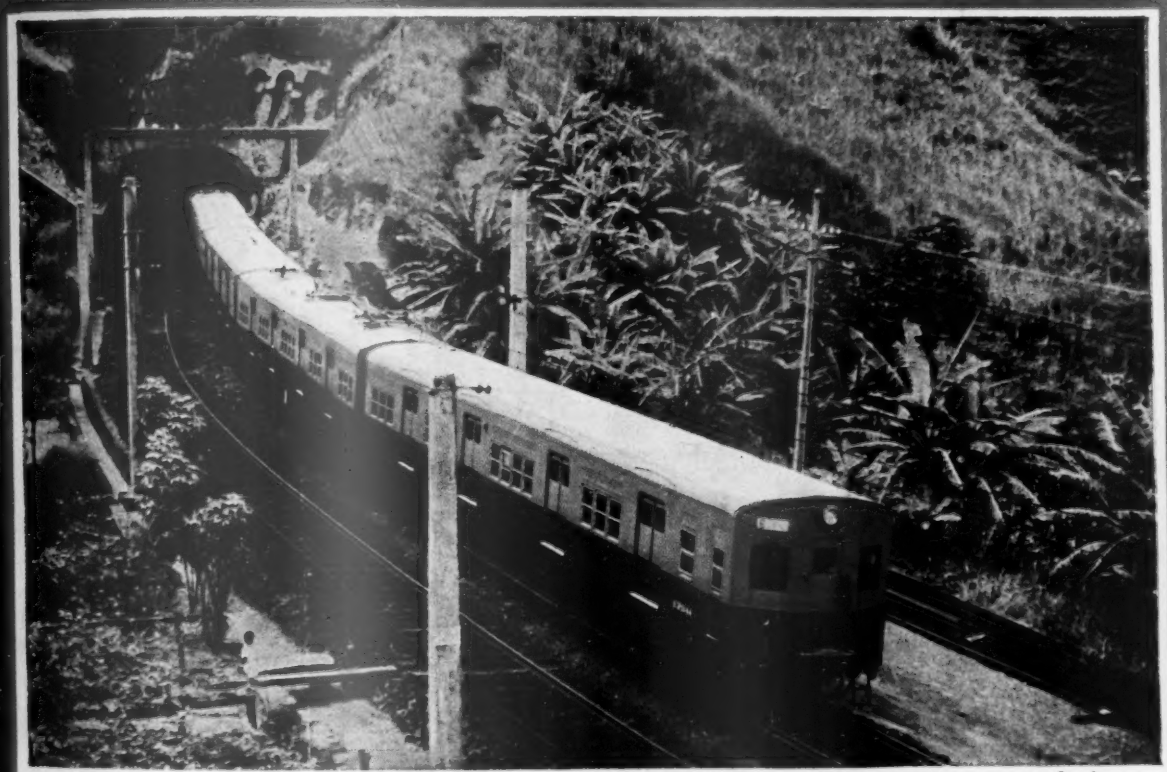

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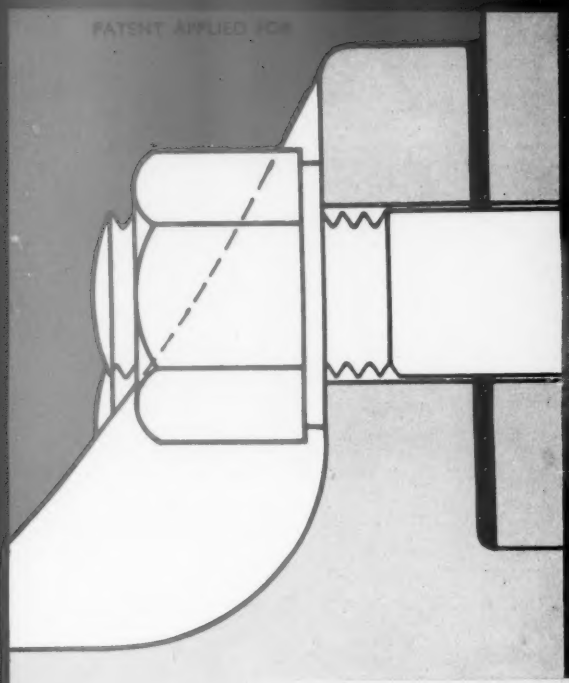

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Delivery of Main-Line Diesel Locomotives

COMPLETION last week of the last steam locomotive to be built at Crewe, where all future new construction is to be of diesel locomotives, is a reminder of the great effort and resources now being directed by railway works and British locomotive building firms to production of main-line diesel locomotives for British Railways. The Minister of Transport & Civil Aviation, Mr. Harold Watkinson, stated in the recent debate in the House of Commons that the Government had authorised an increase in capital expenditure by the British Transport Commission in 1959 to speed up the production of main-line diesel locomotives. Radical improvements in passenger and goods services and economies in operation of motive power can be achieved only when diesel locomotives are in service in adequate numbers on an area basis, so that complete services can be diesel worked. The number of main-line diesel locomotives now on order from British Railways works and private builders is less than 600, of which some 90 are reported to have been delivered. The Minister has stated that by 1961, 1,100 are to be in service. It is to be hoped that after the inevitable initial difficulties, production of the several types will flow smoothly. A good deal of time has had to be spent on perfecting prototypes embodying new features. It will have been well spent if better performance results in the many locomotives to be built. The turning over to diesel traction of a large part of British Railways, the busiest railway undertaking in the world, is a large-scale operation demanding meticulous care if money and effort are not to be wasted through unnecessary failures. That is not to deny that there has been commendable boldness in applying new conceptions in mechanical engineering. One may hope that completion of diesel locomotives soon will compare with the flow of railcar deliveries that has continued for many months. Meanwhile, the problems are being faced of building electric locomotives and stock for a.c. operation. In this case, however, introduction of improved services does not depend immediately on deliveries of locomotives and multiple-unit stock.

Mr. Taylor Thompson

FOR the second time within a month, British Railways will lose the services of a Chief Civil Engineer. Following closely on the retirement of Mr. F. E. Campion from the Southern Region, Mr. Taylor Thompson leaves the London Midland Region next week. Having trained on the former North Eastern Railway, and after many years' experience in north-east England, Mr. Taylor Thompson became thoroughly acquainted with the civil engineering problems of the area. When, in 1948, the railways were nationalised, it was a natural choice that he should be selected as the first Civil Engineer of the North Eastern Region. To meet the demands of the heavy traffic in that region, considerable development took place at York and elsewhere, after the war. Mr. Taylor Thompson was largely responsible for this work. Later, as Chief Civil Engineer, London Midland Region, he played a prominent part in the modernisation plan of that region, including the main-line electrification scheme. Mr. Taylor Thompson assisted in the design of British Railways standard flat-bottom rail. His advice also was sought and valued outside the railways; he took an active part in the Institution of Civil Engineers, and is Past-President of the Permanent Way Institution.

Disappointing Traffics on French Railways

INDUSTRIAL expansion in France has slowed down during the current year. This is one reason, in the view of the management of the French National Railways, for the fact that the volume of goods traffic on the S.N.C.F. during the first 10 months of 1958 was about the same as for the corresponding period of last year. Passenger traffic decreased by 3 per cent, which is attributed to the growth of private road transport. Meanwhile improvements are being carried out as fast as the financial situation allows. Some 330 route-miles will have been electrified by the end of this year, bringing the total electrified mileage to nearly 4,000, or 16 per cent of the system, carrying 47 per cent of all traffic. Further electrification, at 25 kV. in the Northern and Eastern Regions, and, it is understood, of a further section of the Paris-Marseilles main line in the Mediterranean Region, at 1,500 V. d.c., is to be continued in 1959. No further closing of branch lines seems to be contemplated, except in isolated cases. The branches now left open, after the many withdrawals of services in recent years, apparently are regarded as useful feeders.

Monorail Transport

CONGESTION of roads on the surface and the high cost of building underground railways and roads has caused a renewal of interest in building elevated railways. This fact is emphasised by Colonel S. H. Bingham, former General Manager of the New York City Transit

Authority, in a paper on monorail systems read recently to the Society of American Military Engineers. It is as an elevated transport system clear of the ground, he points out, that the monorail can be effectively used, neither adding to nor causing traffic congestion on the surface. Another application is in the hauling of bulk materials, particularly ores and timber. He states that he has been making studies of an automatically operating system capable of hauling large tonnages of crude iron ore. For passenger movement the monorail is claimed to be capable of a safe, fast, and comfortable service. Trains running on rubber tyres assure quiet operation. Such a system, in Colonel Bingham's view, can be installed quickly, and at a much lower cost than conventional transport systems. Nevertheless the problem of locating the track and supports in thickly populated areas is formidable. As he points out, the idea of monorail is not in itself new. It did once represent a radical enough change in the concept of transportation to provoke an opposition which in some quarters still persists. Compelling conditions for its acceptance had not then developed. These conditions do exist today, and as time passes may become more compelling.

Computers for Railway Work

THE work being done by British Railways in examining the great variety of applications for electronic digital computers was emphasised by Mr. G. H. Hinds, Electronics Advisory Officer, British Transport Commission, in a paper on computers and railways read to the Railway Students Association, at the London School of Economics last week. The first digital computer to be installed by any railway, he believes, in the world, and certainly in Western Europe, to be used solely for engineering and scientific calculations was inaugurated in British Railways Research Department at Derby last month. There are also four computers installed for clerical work in the Regions. The Western Region had the first three computers to be operated by any railway in Western Europe. These are all working on payrolls. The fourth, in the North Eastern Region is being used for payroll and statistics in the Traffic Department. Detailed studies of what information is required from computers is in progress in all the remaining Regions. The most extensive of these is by the Scottish Region, where the use is being examined of a computer installation to carry out the whole of the figure work for that Region. This is thought to be the most ambitious scheme in British Railways, and probably in the country.

Indian Railways Leap Ahead

IT is difficult to realise the rapid steps made by Indian Railways since 1950 to keep pace with the phenomenal industrial development of the country. During the seven years to 1956-57 their hand-in-hand advance was almost identical, industrial production rising by 49·8 and railway ton-mileage by 49 per cent. above the 1950-51 index figure. Even more spectacular was the increase in ton-mileage in the three years to 1956-57 when it soared by no less than 40 per cent. This increased carrying capacity was due largely to improved operating efficiency; one side-light confirming this is the reduction by 20-25 per cent in the average time taken for a wagon to pass through marshalling yards during this period. During 1956-57, 124,000,000 tons of goods were moved by the railways, 38,000,000 tons or over 30 per cent of this tonnage being coal, a remarkable figure in a mainly-agricultural country; the total figure estimated for 1957-58 is 132,000,000 tons. Passenger traffic also has increased by some 160 per cent since 1938-39. Although the all-India index of wholseale prices has risen by as much as 313 per cent and wages by 172 per cent, fares have increased by only 90 per cent and cost of goods transport by 101 per cent. These and other facts are pin-pointed in an official booklet "India's Life Line" reviewed on another page.

Two Passenger Classes or Three?

TWO passenger classes now obtain on British Railways and on most systems in Europe. These should suffice for most traffics, and it is often feasible to provide only second class accommodation, as in some British Railways London suburban trains and in some railcars and railbuses. On the Continent, however, there is a tendency to create a new class. The report presented at the Association of British Travel Agents annual convention held recently in Torquay, draws attention to the increasing number of trains in Europe, such as the "Trans-Europe Expresses" (T.E.E.) and fast railcars which command a supplement above the first class fare. This complicates booking arrangements. Some railway managements have claimed that a supplement is necessary to control bookings in a limited formation. That is not the case. Reservation is a separate matter. There is something to be said for charging extra for high speed, though some of the supplements on the Continent are, relatively, so low that international tickets and coupons might be made valid for the trains concerned without further payment. In this country the additional charges are for comfort; they are Pullman and sleeping car supplements. British all-Pullman and all-sleeping-car trains moreover include both first and second classes.

A.C. Overhead Equipment for Indian Railways

IN receiving a contract from the Indian Railway Board for the design, supply, and installation of 25-kV. 50-cycle, single-phase a.c. overhead equipment, the British Insulated Callender's Cables Limited group of companies will become the first British manufacturer to undertake high-voltage a.c. electrification work outside the United Kingdom. The value of the contract, which was obtained against keen international competition, is some £2,500,000. About 60 per cent will be spent in Indian currency on locally manufactured materials and local staff and labour costs, while some 40 per cent will be in materials to be supplied from Britain. The section to be electrified is in the Calcutta area on the main line to Nagpur and Bombay of the South Eastern (former Bengal Nagpur) Railway, between Tatanagar and Rourkela, also the branch from Rajkharswan to Dongaposi; a track mileage of some 420 miles. The Indian Railways adopted the high-voltage a.c. system early in 1957, as standard for all future electrification work. Lines in the Bombay and Madras districts were equipped before the last war for 1,500-V. d.c. operation. Recent electrification near Calcutta has been at 3,000-V. d.c.

Dual-Purpose Wagons

THE problem of return loads and returned empty wagons has existed since the beginning of railways. Recent attempts to solve it are the collapsible container and the folding bag, examples of both of which have been mentioned recently in this journal. Reference was made in our issue of July 18, 1958, to dual-purpose tank wagons placed in service experimentally on the Nigerian Railway. They convey high flash-point oils in the centre, cylindrical tank up-country, and edible groundnut oil to the coast in pannier tanks. The design derives from the impracticability of using expendible bags. A description is given on pages 771-773 of this issue. Much ingenuity has been exercised to obtain relatively large payloads of both kinds of oil. Despite efforts to simplify construction, the capital cost of the wagon would appear to be necessarily high. An important problem presumably is that of rates to afford an adequate return on capital investment.

Diesel Expresses to South-East Kent

THE flexibility in passenger train operation afforded by diesel sets is illustrated in the plans of British Railways, Southern Region, to work many of the weekend services between Charing Cross and Ashford and Folkestone and beyond with multiple-unit diesel trains. This will be done by borrowing spare diesel-electric trains which are used

during the week for the services between Charing Cross and Tonbridge, Tunbridge Wells, and Hastings, but are not needed at weekends. The result will be that on Sundays there will be hardly any steam trains running from or to Charing Cross, though there will still be some on Saturdays when there are fewer Hastings diesel-electric units to spare. The arrangement will start on January 10, 1959, and continue as long as the sets are not needed for the Hastings line. It is to be hoped that it can be extended. The existing steam service on the Folkestone via Ashford line is reasonable in view of the populations of the places served. It could be much improved by diesel operation throughout the week. That would end steam working at Charing Cross, and afford towns in South-East Kent the faster and more frequent service which they eventually will gain on electrification, but only after conversion of the Kent Coast line via Chatham and Faversham.

Inventor of the Bouré Key Locking

CONTINUING his articles on signalling pioneers in *La Vie du Rail*, to which we have already made reference, Monsieur Charles Lecomte gives an account of the life of Paul Bouré, the inventor of the key interlocking system so widely used on the Continent. Born at Nauroy, in Northern France, in 1860 Bouré entered the service of the former Paris, Lyons & Mediterranean Railway in 1883 in the traffic department. He eventually became Divisional Manager in Paris, and retired in 1920. In 1894 he patented in France and a few other countries his key interlocking mechanism, which was adopted by other railways before his own, especially the Northern and Eastern Railways of France. The Northern by 1899 had equipped some 530 stations at a cost of about £18,000. In the following year Bouré was awarded a gold medal at the Paris Exhibition. In 1896 he had assigned the manufacturing rights to the firm of Trayvou at Lyons, agents for the Bianchi-Servettaz hydraulic power signalling apparatus. The Bouré key equipment is still being made today, as for example in connection with new signalling work in Spain. Its inventor, who lived in retirement in Paris, died on March 6, 1937, in his 77th year.

False Clear Signal

THE collision at Chinley on March 8, 1958, arose from a home signal being held irregularly at clear by frost. Its lever was proved in the block controls but not its arm, as this was normally easily visible from the box and the signalman could be expected to observe it or its backlight. He failed to do so and did not obey the rule requiring him to set his facing points for an unoccupied overlap before accepting the second train, something he admitted to doing often. In addition the signalman in advance had acquired, as he acknowledged, the bad habit of not restoring his distant signal lever promptly on the arrival of a train, with the result that the driver of the oncoming express, fortunately checked by the preceding distant signal, was led to increase speed somewhat. He was fully alert, however, and the impact did not have very serious consequences. The case raised the whole question of signalbox discipline and supervision and the value of the cross-checking of registers—as will be seen from our summary in this issue of Colonel W. P. Reed's report—something figuring unpleasantly in two or three accidents of late years and to which the report makes reference. A register cross-check is now to be carried out twice yearly, in the Region concerned, either by signalmen's inspectors or stationmasters.

Last Steam Locomotive from Crewe Works

COMPLETION last week of the last steam locomotive to be built at Crewe Works brings to an end the steam locomotive building on British Railways, London Midland Region. The last locomotive, No. 92250, a Class "9" 2-10-0, is the 7,331st. steam locomotive to be built at the works since it was established in 1843 by the Grand Junction Railway. The latter undertaking was one of the original partners in the London & North Western Railway, created in 1846, and which in its turn amalgamated into the L.M.S.R. in 1923. Many famous locomotives have been built at Crewe. Probably the best known of the earlier ones were *The Lady of the Lake* and its sisters, designed by John Ramsbottom and turned out from 1858 onwards. Francis William Webb succeeded Ramsbottom and remained in charge for 32 years during which time he built over 2,500 locomotives of many different classes. There followed George Whale's "Precursors" and "Experiments" and C. J. Bowen-Cooke's "George the Fifth" series. In 1933, Sir William Stanier built at Crewe the first Pacific for the L.M.S.R. These were the "Princess" class and were followed in 1937 by the "Coronation" class, also designed by Sir William Stanier. Attention at Crewe will now be turned to diesel-electric locomotives and the heavy repair of existing steam locomotives.

Railway Financial Difficulties

THE pamphlet, "Paying for the Railways,"* issued last week by Political & Economic Planning (P.E.P.), describes impartially and on the whole accurately the origins of the present financial difficulties of British Railways, analyses remedial policies recently pursued, and discusses long-term solutions. The last include subsidies in various forms. The title of the pamphlet might suggest that subsidy is considered by the authors to be inevitable, at least for some time. A railway system on a completely commercial basis free of Government control or restrictions as to charges or services, is briefly considered as a solution. It is not ruled out as politically impracticable, but attention is drawn to the disadvantages of withdrawing, as unremunerative, services on which some railway users now rely, and of consequent redundancy among railwaymen. The fact is not stated that no railway system of any size so untrammelled by Government regulation exists in any country, even where a policy of *laisser-faire* is most favoured.

The most controversial passages are concerned with forms of subsidy. "If the railways are to continue to fulfil social functions," it is stated, "some form of subsidy must be provided." As British Railways and the London Transport underground lines are public services, this implies that the railways cannot pay their way, which is an unproved assumption. On the other hand, they are admitted to be able to play a vital role in transport. The evils of, and insuperable objections to, a subsidy, the lack of any spur to efficiency, and of financial discipline, are not emphasised. The solutions reviewed which involve subsidy of the railways are: First, a compromise between a purely free commercial undertaking and a public service, with subsidisation of services deemed after review by a single transport authority to be essential for the public welfare; second, a general subsidy; and third, nationalisation of long-distance road transport and its "co-ordination" with the railways. Adoption of the last course might result in the nationalised transport undertaking as a whole paying its way, with the railways subsidised by road haulage. It would pose complex questions, including that of the right of the user to choose the mode of carriage. Of these, the first and third are stated to be economically sound, though politically controversial. A flat subsidy rightly is held to be economically unsound, but the reasons are not fully explained. The first solution suggested might perhaps be considered in relation to losses on lines which are considered essential for strategic reasons, but have no economic justification. We doubt whether it is possible to place more than one or two sizable sections of British Railways in this category. As P.E.P. observes, there are disadvantages in reducing facilities. They include the impossibility of spreading overhead charges and loss of feeders. The railways are, and must long remain, a public service. Some railway facilities, therefore, must help to pay for others.

As to the outline of the history of railway charges, road

* Political & Economic Planning, 16, Queen Anne's Gate, S.W.1. Price 3s. 6d.

competition, the starving of the railways of capital investment, and the possibilities of the new freight charges scheme and of the modernisation plan, the main facts are stated fairly and correctly. We cannot entirely agree with the statement as to the low rates of railway pay compared with those in other walks of life.

British Transport Commission Traffic Receipts

BRITISH Railways freight and parcel receipts for the twelfth period of the year, the four weeks to November 30, followed much the same pattern as for the preceding four weeks. Merchandise and livestock at 12·2 per cent below last year's figure for this period, showed a slight improvement over Period 11, both absolutely (£7,554,000 compared with £7,459,000) and in the percentage decline against the corresponding figure for 1957 (12·2 per cent compared with 14·3). Circumstances vary from month to month and no deduction can be made.

It is possible to draw conclusions only in respect of the longer periods. For the 48 weeks to November 30, the total freight and parcels receipts of British Railways this year were only £299,128,000 compared with £326,758,000 in 1957. How far coal traffic may be expected to recover is problematical. The recent agreement between the British Transport Commission and the Electricity Generating Board is expected, according to Mr. Harold Watkinson, Minister of Transport & Civil Aviation, to result in 3,000,000 to 4,000,000 tons of coal being regained by the railways in the next six to 12 months. In view, however, of generally declining coal consumption the future of coal traffic, class receipts from which are more than one third of total receipts, is not bright. Mineral traffic may take some time to servive, as it reflects activity in the iron and steel industry, which may be slow to resume the normal pace of production. All the more effort will be necessary, therefore, to capture mechandise and parcels traffic. Receipts from the former have amounted to less than one-third of those from total goods and parcels receipts. The fact that the poor freight receipts are the result largely of the recession in industry is shown by the receipts for the Commission's other carrying activities, mainly British Road Services, but also inland waterways freight, and ships. For Period 12 they were £4,343,000, compared with £4,496,000 for the same four weeks of last year. Their aggregate for the 48 weeks was £50,587,000, only a little less than that for Periods 1-12 of 1957.

—	Four weeks to November 30, 1958		Incr. or decr.	Aggregate for 48 weeks		Incr. or decr.
	1958	1957		1958	1957	
	£000	£000	£000	£000	£000	£000
Passengers—						
British Railways	8,491	8,373	+ 118	127,931	129,027	− 1,096
London Transport:						
Railways	1,845	1,812	+ 33	22,409	21,322	+ 1,087
Road services	4,197	4,524	− 327	44,484	54,853	− 9,369
Provincial & Scottish buses	4,147	4,157	− 10	55,619	53,404	+ 2,215
Ships	179	181	− 2	6,608	6,577	+ 31
Total Passengers	18,859	19,047	− 188	257,051	265,183	− 8,132
Freight, Parcels and Mails—						
British Railways:						
Merchandise & livestock	7,554	8,604	− 1,050	85,707	99,919	− 14,212
Minerals	3,696	4,443	− 747	41,606	49,454	− 7,748
Coal & coke	9,359	11,203	− 1,844	112,384	117,676	− 5,292
Parcels, etc., by passenger train	4,095	4,205	− 110	47,990	47,317	+ 673
Collection and delivery, etc.	1,020	1,029	− 9	11,441	12,392	− 951
Total Freight, British Railways	25,724	29,484	− 3,760	299,128	326,758	− 27,630
Others*	4,343	4,496	− 153	50,587	51,391	− 804
Total Freight, Parcels, and Mails	30,067	33,980	− 3,913	349,715	378,149	− 28,434
Total	48,926	53,027	− 4,101	606,766	643,332	− 36,566

* Inland waterways, freight, road haulage, and ships

The passenger receipts of British Railways for Period 12 slightly exceeded last year's figure. The aggregate to November 30 at £127,931,000 is less than that for the corresponding weeks of 1957 (£129,027), largely because of disappointing holiday traffic last summer. London Transport road services receipts at £4,197,000 for the period, against £4,524,000 for the same four weeks of 1957, reflect the drop in bus traffic of the last months.

PERCENTAGE VARIATION 1958 COMPARED WITH 1957

	Four weeks to November 30	48 weeks to November 30
British Railways—		
Passengers	+ 1·4	− 0·8
Parcels	− 2·6	+ 1·3
Merchandise & livestock	− 12·2	− 14·2
Minerals	− 16·8	− 15·8
Coal & coke	− 16·4	− 4·4
C. & D. services	− 0·8	− 7·6
Total	− 9·6	− 6·3
Ships, passengers	− 1·1	+ 0·4
British Road Services, Inland Waterways and Ships (cargo)	− 3·4	− 1·5
Road Passenger Transport, Provincial & Scottish	− 0·2	+ 3·0
London Transport—		
Railways	+ 1·8	+ 5·0
Road services	− 7·2	− 18·9
Total	− 4·6	− 12·1
Aggregate	− 7·7	− 5·6

Western Australian Government Railways in 1957-58

THE Commissioner for Railways, Western Australia, Mr. T. Marsland, has sent us particulars of results of working of the Western Australian Government Railways for the year ended June 30, 1958. These show a retrogression over the immediately preceding year of £142,660. There was a drop in earnings of £1,068,935, and in working expenses of £1,168,654, but this favourable result was offset by increases of £183,185 in depreciation payments and £59,194 in interest.

Comparative financial figures of the past two years were:—

—	1956–57	1957–58	Incr. or decr.
	£	£	£
Earnings	14,044,111	12,975,176	− 1,068,935
Operating expenses	16,011,316	14,842,662	− 1,168,654
Depreciation	1,257,391	1,440,576	+ 183,185
Interest	2,055,341	2,114,535	+ 59,194
Deficit	5,279,937	5,422,597	+ 142,660

A heavy wheat lift during 1956-57, which included a big carry-over of wheat from previous seasons, was the principal cause of the higher earnings in that year. With the return to normal wheat haulage the earnings dropped. The reduced haulage enabled expenditure to be reduced proportionately, and this, coupled with a drive to effect economy wherever possible enabled the lower operating figure to be recorded.

The capital investment at June 30, 1958, was £46,772,726, an increase of £1,132,660. The percentage of operating expenses to earnings was 114.39. Train-miles run were 7,326,966, a reduction of 951,020. Country passenger train mileage and goods train mileage both decreased, but suburban passenger train-mileage increased as the result of great patronage. Earnings per train-mile, with the preceding year in brackets, were 410.68d. (394.54d.) and operating expenses 471.82d. (451.42d.).

Passenger journeys totalled 14,384,220, an increase of 808,005. The increase was wholly in the suburban area, where the frequent service now available, free parking at suburban stations, and other measures to attract traffic, has brought travellers to the railway. Country travel showed a small decline because of the increase in private road vehicles.

Goods traffic declined. Ton-mileage figures were reduced from 667,695,009 in 1956/57 to 572,175,726. Wheat was the

principal contributor to this decline. The ton-mileage fell from 199,745,105 to 107,906,353. Other grain and grain products also showed reductions. Fertilisers increased by 2,360,576 ton-miles. Livestock showed a small reduction, and special efforts are being made to recover this traffic much of which has gone to the road in recent years.

The average haul for all traffic was 159.43 miles (158.11 miles in 1956/57), total earnings for goods traffic £10,361,486 (£11,495,292) and earnings per ton-mile 4.35d. (4.13d.). The principal traffics moved were coal-class traffic, 12.97 per cent of total ton mileage; timber, 10.68 per cent; fertiliser, 10.3 per cent; wheat, 18.87 per cent; ores and minerals, 10.03 per cent; oil in tank wagons, 4.76 per cent, and general goods (A. B. C. first and second classes), 13.31 per cent.

The average number of miles open was 4,117. The average staff employed was 13,398, a reduction of 704. The mean population of the State was 699,000, an increase of 15,000.

Trends in Diesel Engine Design

METHODS already adopted which have proved successful in enhancing the reliability and performance generally of all kinds of diesel engine, including railway traction types, are reviewed by Mr. L. D. E. Brodie, Chief Engineer of the Industrial Division of Grosvenor Motors, and former Chief Engineer of National Transport & Engineering, Johannesburg, in a paper, "Modern Trends in High-Speed Diesel Engines," read last week to the Diesel Engineers & Users Association by Mr. D. S. D. Williams, President of the meeting, in Mr. Brodie's absence.

Typical of recent developments is a "cooling group" to combat the tendency for individual pistons to seize, caused by steam pocketing in the engine cooling jacket at altitude and high ambient temperatures. In this the rate of cooling is controlled by a hydraulically-driven radiator fan, the speed of which is related to the temperature of the engine and not, as in existing practice, to the crankshaft speed. In the search for ways of saving weight to improve payload in mobile installations such as railcars, where engine speed increases are advantageous, the co-operation of metallurgists, chemists, and oil specialists has been sought to deal with many problems arising from higher bearing and cylinder rubbing speeds, higher piston temperatures, and to devise lubricating oil additives which reduce wear and prevent piston ring gumming in all conditions of service. The result of such research work is that higher engine speeds can now be achieved safely. Special alloying elements for both cast-iron and aluminium improve strength to resist thermal stresses and reduce the coefficient of expansion, so that running clearances can be smaller.

As to valves, Mr. Brodie rightly points out that the use of hardened inserts for valve seats has much increased cylinder head and valve life between overhauls, and that rotating valves keep the seats clean for longer periods. He believes, however, that more research is required into cam profile design. Hydraulic type governors and the new C.A.V. DPA distributor type fuel pump are both highly praised by him as important advances in design. His own experience leads him to prefer recent types of paper cartridge or element for filtering lubricating and fuel oils. For conditions in some parts of South Africa where the dust is highly abrasive, though it has the same consistency as face powder, a paper filter element used in series with an exceptionally large oil-bath filter to reduce air intake velocity, is mentioned as a promising development. This is aimed at increasing the life of engines, such as those of locomotives and railcars, the movement of which, as on the track, could sometimes reduce the efficiency of a normal oil-bath air filter.

He goes on to explain how pressure charging does not necessarily increase bearing pressures even though the engine output is increased. The more complete and even rate of combustion possible with pressure charging, avoids too rapid a rise in cylinder pressure near the piston top-dead-centre position. Lead-bronze bearings used with surface-hardened crankshafts have enabled designers to double the bearing pressures. He foresees the development of exhaust-gas-driven turbo-chargers which not only improve specific fuel consumption at the full-rated power of a given engine, but also can equal the performance at intermediate diesel engine speeds and loads which, at present, is associated only with mechanically-driven blowers.

Rail-end Hardening in New Zealand

THE hardening of rail ends to combat batter is of interest to railways in all parts of the world, and the experience of engineers in the British Commonwealth in such matters is more than usually valuable. For this reason we record below some of the points made in a paper to the British Commonwealth Welding Conference last year by Mr. G. K. Colligan, President of the New Zealand Institute of Welding.

The problems faced by the New Zealand Government Railways are first outlined. Its 3,500 route-miles of line are all of 3-ft. 6-in. gauge and are largely in difficult country involving many bridges, viaducts, tunnels, curves and gradients as steep as 1 in 50 on the main lines and 1 in 25 on two branches. The heaviest and most powerful steam locomotives of the 4-8-4 type weigh with tenders 140-145 tons, but they are now being replaced by diesel-electrics. Many of the main lines are still laid with 70-lb. rails, though they are being replaced by 91-lb. as rapidly as funds and other considerations permit. Consequently speeds have to be limited to 50-55 m.p.h. for locomotives and 60 m.p.h. for railcars, but even so rail fractures do occur, mostly near the joint or rail end, and effects of batter are cumulative. Although the building up of rail is possible, it is preferable to prevent or control wear by such methods as the hardening of the rail end.

As well as heavy vertical loads on a very small area and side thrust also, the rail ends are subject to severe impact at any speed above a crawl. Consequently, if the rail surface is unduly hard, stresses in excess of the fatigue limit occur about $\frac{1}{4}$ in. below the surface of the rail and the upper layer will spall. On the other hand, a controlled increase in hardness at the rail end improves fatigue resistance and prolongs the rail life.

In New Zealand the rails as originally received are from 30 to 40 ft. long, but the 91-lb. rails are now being flash-butt welded into 210-ft. lengths, and it is the ends of these long rails that are hardened at three main depots. The method and plant used were described in our issue of April 11 last. The composition of the rail has the greatest influence upon the results obtained from flame hardening, and the Government Railways' specifications for 91-lb. rails include the following composition within certain limits:—

Element	*U.K. (Acid)*	*U.K. (Basic)*	*Bessemer*
Carbon	0·45–0·55	0·50–0·60	0·40–0·50
Manganese	0·90–1·20	0·90–1·20	
Silicon	0·10–0·30	0·10–0·30	
Phosphorus	0·60 max.	0·05 max.	
Sulphur	0·06	0·06	

The limiting ranges of the first three elements are fairly wide and appreciable variations do occur in the hardness, especially rails received from different makers.

It was early appreciated that with controlled heating and quenching the hardness results were directly related to the initial hardness of the rail. A rail of originally low hardness, even if showing a satisfactory increase or rise, would not develop as high a hardness from the flame-hardening treatment as the rail of high original hardness. This has the advantage that the surface of the rail end so produced does not differ too greatly in hardness from the main part.

The principal aim in heat treating a rail is to obtain a definite percentage increase in hardness over that of the untreated rail. To this end in New Zealand, the 91-lb. rails now being end-hardened are treated for $1\frac{1}{2}$ to 2 in. from the end and to a depth of from $\frac{3}{16}$ to $\frac{1}{4}$ in. To avoid surface cracking or shelling there should be a definite hardness range which should not be exceeded. In flame-hardening the hardness or toughness should be increased sufficiently to ensure prolonged service life and yet retain enough ductility to withstand continued impact loading; an increase in hardness of 100 Brinell is about what is required. At the same time there should be a uniform

transition from the unhardened to the hardened area in both body and surface of the rail so as to avoid an abrupt change of grain-structure of the body and local failure. Abrupt changes in surface hardness may induce equally abrupt change in rate of wear.

Some eight or ten years ago N.Z.R. engineers, and the equipment and gas manufacturers decided to co-operate in developing a suitable process of rail-end hardening to increase rail life. At first it was applied in the track but is now carried out in main depots after the rail-lengths have been flash-butt welded into long lengths but before laying. However, it was to be extended to rail-ends already in the road. The specified general hardness was of 350-400 Brinell for a distance of 1¾-2 in. at the rail end, but the first ¼ in. was to be of only about 280-300 to prevent chipping of the square edge.

A number of different methods and refinements in apparatus were tried and eventually it was decided to adopt the self-quench method using the body of the rail as quenching medium, and eliminating as far as possible any chance of variables occurring in the procedure, such as had been found when using a water quench and also in the speed of the traversing movement of the flame head. In fact, it was decided (1) to eliminate any form of traverse or movement in the head, (2) to mount the jig holding the head so as to ensure a constant position of the flame relative to the rail end, (3) to make sure that the timing of the heating operation was precisely carried out by using a stop-watch, and (4) to arrange for the same flame adjustment or heat value to be obtained for each operation.

To fulfil these requirements the following equipment had been finally standardised:—(1) a bank of at least six oxygen and six acetylene cylinders with special heavy-duty regulators and hoses; (2) a valve block with stand and quick-acting valves, flame-adjustment valves, and a metering gauge to ensure the adjustment of a consistent heat value for each operation; (3) a flame-hardening head and mixing unit mounted on a jig positioning it accurately on the rail head; and (4) a flame-plate or baffle.

The inclusion of this particular baffle more than anything else secured the success achieved by this apparatus and method. It is fabricated from mild-steel plate and closely fits the rail head, only the part of the rail to be hardened being exposed to the flame; the section of the baffle farthest from the rail end is however left open, as it was found that the blanketing off of this section of the rail led to an undesirably sharp change in hardness.

The design of the flame-head and the spacing and size of the flame-ports are of special importance. Some 700 cu. ft. of each gas is consumed per hour and the time taken to harden one rail end is only 10 sec., so that a very large volume of heat is delivered in a very short space of time, and it is these essential factors that affect the equipment and its success. With such short heating time only minor discrepancies in setting up and operating are permissible.

Uniform heating is secured by using a "patterned" flame with different-sized flame-ports in the head, of which there are 52; the sizes vary from No. 70 to No. 55 drill gauge. The different sizes as arranged allow for the difference in quenching effect between the centre and outside of the rail and for the slightly convex shape of the rail head. The distance between the flame-head and rail surface is precisely set with a ⅜-in. gauge, and is checked subsequently at intervals during the day's working. An error of $\frac{1}{16}$ in. in this distance could lead either to overheating the surface or to unsatisfactory hardness results.

The jig holding the flame-head is so designed that the head can readily be pivoted up and away from the rail surface for adjusting the flame or for moving from rail to rail. Quick-acting clamps and screws ensure correct alignment and height. The only other measurement required is to make sure that the flame-head is set back ¼ in. from the rail end, otherwise the square edge will become overheated. For rail-end heating in the track a different shape of baffle is necessary, and the adjacent unheated rail end must be protected with asbestos.

Though the apparatus is designed for handling by semi-skilled staff, the operator must be trained to understand the object of the process and functioning of the plant, so that he can recognize at once any potential trouble that may become apparent. It is essential that he shall be able to recognise flash-back and know how to deal with it. Instruction in taking hardness readings with a small Brinell instrument before and after hardening is also necessary.

Mr. Colligan's paper makes it clear that high-power oxy-acetylene flames can be readily controlled to produce results under what are practically field conditions, with a consistency comparable with the fine limits of production-line machines.

Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

The First Excursion Train

December 19

SIR,—The Archivist of Thos. Cook & Son Ltd. asks which was "the first publicly-advertised railway excursion train." Presumably he means the word "excursion" in the sense given by the "Concise Oxford Dictionary," namely, "journey, ramble, with intention of returning; pleasure trip of a number of persons." The introduction of cheaper-than-standard single fares by ordinary trains would seem, therefore, to be irrelevant. If the enquiry is confined to mechanically-operated trains, it seems probable that first excursion train was run on Thursday, September 16, 1830, between Liverpool and Manchester. The Liverpool & Manchester Railway was opened on Wednesday, September 15. On Thursday, the "first journey performed for hire" was run. A train, hauled by the *Northumbrian*, left Liverpool in the morning with 130 passengers and arrived at Manchester in 1 hr. 50 min. It returned in the evening in 1 hr. 48 min. The fare charged was 7s. Ordinary passenger traffic began on Friday, the 17th.

Another early excursion was run on August 16, 1831, when an excursion party of nearly 100 persons went from Sheerness to Whitstable by boat, and thence to Canterbury by the Canterbury & Whitstable Railway. Excursion traffic on the horse-operated Oystermouth Railway was recorded as early as 1813.

Yours faithfully,

CHARLES E. LEE

London, W.C.1

Mis-use of Diesel Railcars

December 10

SIR,—In the editorial note of December 5 on the stopping of a passenger train for one passenger you conclude: "With a railcar it would often be a mistaken policy to allow the relatively low cost of stopping and re-starting to risk goodwill by causing elimination of halts."

In these cases it is usually not a question of the cost of stopping and starting which is the primary consideration. It is the cost in time. Even with the faster acceleration of the railcars compared with the steam train, the introduction or retention of little-used intermediate stops has an appreciable retarding effect. This extends the journey time of the bulk of the passengers, most of whom travel between the main centres of population. Speed must be offered, if more traffic is to be captured from the roads.

Even more damaging is the effect of unnecessary stops on the working of the railcar and crew. Their potential daily mileage is seriously reduced. This involves more units being employed in a particular area than need be, and thereby perpetuates uneconomic steam operation in other areas. In many places diesel railcar workings only average about 250 miles a day. A figure almost twice as high should be attainable in most areas.

Through acceleration by the elimination of little-used stops, many passenger trains could be made economic, or less uneconomic than they are at present.

Yours faithfully,

H. SAMUEL

THE SCRAP HEAP

Rising Railway Traffics (1898)

The time is fast approaching when enthusiastic statisticians will be devoting themselves to the Home Railways dividend announcements. For the week to December 4, the traffic returns of 33 principal lines showed an increase of £89,700 on the corresponding week of last year, bringing the aggregate increase for the half-year to date to over £1·3 million. The question is how much of this, if any, will remain after allowing for increased capital charges and higher working expenditure.—*From "The Financial Times" of December* 10, 1898.

New Zealand Trunk Line Jubilee

A crowd of more than 2,000 people gathered at Ohakune, New Zealand, on November 6 to celebrate the 50th anniversary of the driving of the last spike of the main trunk railway between Wellington and Auckland. The ceremony 50 years ago was performed by the then Prime Minister, Sir Joseph Ward. Among those who spoke at the jubilee celebrations were the Leader of the Opposition, Mr. K. Holyoake, and the Minister of Railways, Mr. M. Moohan. A Maori tribal leader, Mr. Whata Karanuti, waved a silver spike in place of the traditional spear in his challenge to the official party.

The silver spike which Sir Joseph Ward drove to complete the line is still in the possession of the Ward family, and his grandson, also Sir Joseph, stated that the spike would be sent to Ohakune as a memento.

The accompanying illustration shows the Minister with the General Manager of the New Zealand Government Railways, Mr. A. T. Gandell, and four former General Managers: Messrs. G. H. Mackley, F. W. Aickin, J. Sawers, and H. C. Lusty.

Thousand and One Nights?

He (the A.S.M.) was also complaining regarding his transfer to . . . Station, as his information was that he would still be on night duty. I told him that the hours of night duty there were not so amorous as at his present station, and it was the only station to which he could be posted.—*From the draft of a district officer's tour notes, quoted in "East African Railways & Harbours Magazine."*

U.S.A. Railways Subsidise Air Lines

There is an airport in the Southern Tier of New York State serving what is known as the Triple Cities area, consisting of Binghamton, Johnson City, and Endicott, with a combined population of 120,000, that is served by only two air lines operating medium distance service. . . . The county in which it is located is served by three railroads, including our own. That proportion of the property taxes paid in that county by the three railroads which is allocated to the support of the airport is in excess of the total charges paid by the air lines using the airport. This is not an isolated instance in which railroad tax money is used to establish an airport and support its subsequent operation and maintenance while air line competitors enjoy its use at a cost lower than our tax contributions and take away our passenger business. And if the air lines are not able to exist on the revenue they earn, they receive a direct subsidy from the Federal Government.—*Mr. William White, President of the Delaware & Hudson Railroad Corporation, in "The Times."*

At Ohakune on November 6: (left to right) Messrs. G. H. Mackley, M. Moohan, F. W. Aickin, J. Sawers, H. C. Lusty, and A. T. Gandell

No Sale of Locomotives

An officer of the Nigerian Railway Corporation quotes from his correspondence: " . . . regret your request to sell pof-pof at the loco. shed cannot be granted." "Pof-pof," he explains, is an African dish.

Reckless Speed in 1855

As soon as we had taken our seats [at Cumberland, for Washington] the bell rang and we dashed off. The conductor . . . informed us that we were very late in starting and that it would take smart work to make up the time. To effect this required additional speed. . . . As we expected, an accident did occur. In vain was the conductor urged to slacken the excessive speed. With blind if not wilful recklessness it was maintained and at length, a terrific crash and a series of dislocatory heavings and collisions, terminating in deathlike silence and the overthrow of the car which we occupied, gave a certain evidence that we had gone off the line. . . . I remember being highly delighted when I found my limbs sound. . . . When I saw the state of things I was extremely indignant. I found my feelings were not only unshared, but all rather approved than otherwise the exertions to get us in on time. Accidents on railways are thought so little of in America it is useless to remonstrate.—*From "A Vacation Tour in the United States and Canada" by C. R. Weld (London,* 1855).

Happy New Year!

This is the time to stop the clock
And spend a moment taking stock,
To throw some fleeting glances back
At milestones ranged along the track.
This is a time for resolution,
To cease from counter-revolution,
As diesels dominate the stage,
Precursors of the atomic age.
And while we're in this chastened mood,
We'll wish our readers all that's good
And scrap that wishful-thinking dream
Of the re-eminence of steam
And give our managers *carte blanche*
To close down any blooming branch!
Listen to Scrapheap's words of cheer:
Good luck throughout the coming year
And may a Providence benign
Smile on you all through '59!

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

New Tug Launched

Mrs. D. H. C. du Plessis, wife of the General Manager, South African Railways, launched a new ocean-going tug, the *Danie Hugo*, for the South African Railways, at Port Glasgow on October 15. The new tug is expected to arrive at Table Bay, early in the new year.

New Catering Depot at Johannesburg

The new railway catering depot, an eight-storey building, is being built west of the Queen Elizabeth Bridge, near Johannesburg Station. It will house the administrative staff of the S.A.R. Catering Department and the catering warehouses.

The headquarters and Johannesburg stores of the Department will be housed in one building. At present they occupy several buildings in various parts of the Braamfontein yard. The two separate blocks, one for the warehouses and the other for the administrative staff, will be linked by through passages. The warehouse side will be five storeys high, with provision for one more storey, and the administrative side will be eight storeys high, with provision for two more. Loading bays and six covered platforms are being provided for the provisioning of restaurant cars.

Wherever possible diamond mesh steel partitions will be erected in place of brick walls to improve ventilation and afford better supervision. The stores will be located on upper floors with reception and despatch offices on the ground floor. Goods arriving by road will be taken to the stores by goods lifts. Issues to restaurant cars will be sent from stores to the despatch office on the ground floor by small goods lifts or dumb-waiters. This means that no persons other than the staff will have to enter the building. The ground floor will also house the perishable store, the linen stores, and a special kitchen for demonstrating new techniques to trained staff. The liquor and grocery stores will be in the basement and a reversible slat-conveyor will serve the loading bays and platforms.

CHINA

Pearl River Bridge

Construction began a few weeks ago of a bridge across the Pearl River at Canton to link the Canton-Samshui Railway with the main system. This line was built in 1903, but has been isolated by the Pearl River. In view of the width of the Pearl River, and the amount of navigation, this will be a major bridge of considerable technical interest. It is due for completion in 1959.

Nanping-Foochow Railway

Construction of the Nanping-Foochow Railway is almost complete. Tracklaying has now got to within nine miles of the latter city.

New Works at Kunming

Work has started in Kunming on stations and marshalling yards to deal with the increased traffic resulting from new lines now under construction. Kunming is at present the terminus of the metre-gauge line running up from Viet-nam at Haiphong, but construction is in progress of a new line northwards to the Chungking-Chengtu Railway, which is linked with the railways of North China by the Paochi-Chengtu Railway, now being electrified.

VICTORIA

Redecking of Spencer Street Viaduct

The redecking of 500 ft. of a section of the Spencer Street Viaduct nearest to the Flinders Street roadway, between King and Spencer Streets, and the replacement of a brick pier with a narrow steel and concrete column to give adequate road width for one of the approaches to the new King Street Bridge was recently carried out.

For the redecking operation about 50,000 ft. of red gum timber was used. The job also involved a considerable amount of electric arc welding. The full redecking project will be carried out in stages, and when completed 1,100 ft. of decking of the viaduct under four tracks will be renewed.

ARGENTINA

Purchase of Italian Locomotives

Representatives of the Italian G. A. I. steel group have made a proposal to Dr. Justo P. Villar, the Minister of Public Works & Services, for the provision of Italian-built diesel locomotives by the State Railways, or alternatively the transfer of Italian capital to Argentina for the erection of a new plant.

UNITED STATES

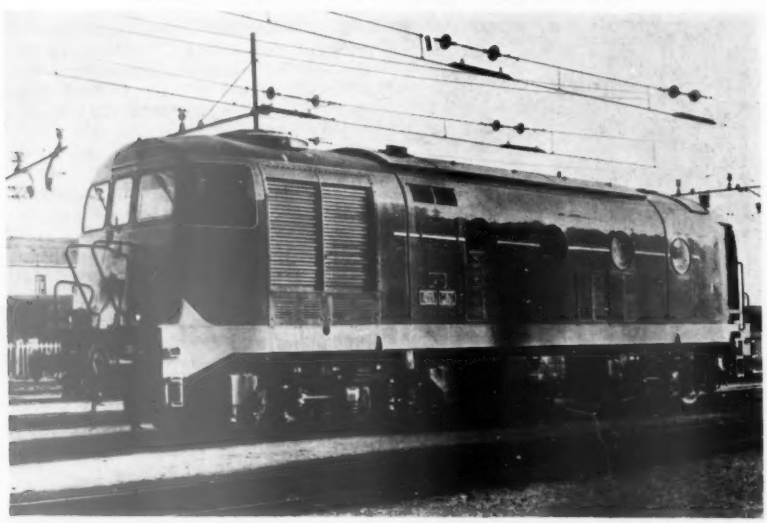
"Discount Dining"

A new step to popularise its restaurant car service has been taken by the Chesapeake & Ohio Railroad. It is now possible for any passenger on the "Sportsman," "Fast Flying Virginian" and "George Washington" trains, to buy meal coupons with his travel ticket, covering breakfast, lunch, or dinner, at a reduction of 20 per cent on the normal meal charges.

Freight Charges Plan

Certain railways are reported to be preparing a plan to offer both large and small consignees of freight rates reduced by 15-25 per cent, provided that consignors undertake to put on rail a guaranteed percentage of their annual volume of traffic. If the Interstate Commerce Commission approves the plan, it should bring back to the railways a good deal of the high-rated traffic now being moved by road.

Diesel Locomotive for Italian State Railways



Diesel-electric locomotive with 1,320-h.p. Paxman engine built by Breda Electromecannica e Locomotive, Milan, for Italian State Railways (*see Contracts and Tenders page of last week's issue*)

Selling Stations

The Boston & Maine Railroad has sold a total of 40 of its passenger stations, subject to a provision that adequate passenger facilities remain available while the stations concerned are still open for passenger business. A further 100 stations are now on offer. If these also are sold, the railway estimates that $1,000,000 will be saved annually on maintenance and other costs.

"Thrift-T-Sleeper" Patronage

Replies to a questionnaire circulated by the Missouri Pacific Railroad among passengers in its "Thrift-T-Sleeper" cars, one of the modern types of sleeping accommodation now offered to "coach" or second class passengers, show that only 10 per cent of the passengers would normally have travelled in Pullman sleeping cars. Some 37 per cent would have used ordinary reclining chair coaches, 23 per cent would have gone by aeroplane, 14 per cent by private car and 3 per cent by long-distance motorbus.

IRELAND

Payments to ex-G.N.R. Staff

Mr. Lemass, Minister for Industry & Commerce, recently moved a supplementary estimate for £50,000 to meet ex-gratia payments to former employees of the Great Northern Railway Board engineering works at Dundalk.

Mr. Lemass stated that, in consultation with him, the board of the company had made interim weekly payments to displaced workers to supplement insurance benefits for which they would be eligible. He had undertaken to move an estimate to recoup the company for that outlay.

It was conceivable, he said, that the company could meet the cost of these payments out of its own resources, but in view of the desire to ensure that it would not be saddled with any unproductive outlay and would be given an opportunity of developing, he felt that they were justified in putting this particular charge on the National Exchequer.

The payments to the workers temporarily laid off had been made for the first time at the beginning of December but were back-dated to October 1.

In reply to a question, Mr. Lemass said that it was hoped to absorb most of the displaced workers, but indications were that about 3 to 4 per cent would be permanently laid off. In these cases it was proposed to pay lump sums amounting to one month's pay for each complete year of service up to a maximum of 24. The rate of compensation would be calculated on the basis of the worker's basic pay at the termination of his employment. The supplementary estimate was passed.

FRANCE

More Couchette Coaches

The numbers of *couchette* berths now available on the S.N.C.F. have risen to 3,566 in first-class and 13,338 in second class. The comparable figures in 1946 were 564 and 1,284. The facility is being increased. By 1961 it is hoped that there will be available a total of 4,980 berths in first- and 31,590 in second-class. By then the stock of *couchette* coaches will have risen to 467 second class, 247 composite first and second, and 110 first class vehicles equipped with *couchettes*. Besides these, many sleeping cars of the Wagons-Lits Company run on the French National Railways.

SWITZERLAND

Doubling of Biel-Berne Main Line

The doubling of the westernmost section of the Biel-Berne main line, the five-mile section between Biel and Busswil, is to be taken in hand shortly. Between Busswil and Lyss the second track is already in service. This will leave only the 10-mile section between Lyss and Zollikofen as single track. At the latter station, five miles north of Berne, the line joins the double-track Berne-Zurich main line.

Preference had been given to the doubling of the 1·8-mile section between Busswil and Lyss as this portion carries not only the Biel-Berne traffic but also that of the Solothurn-Busswil line which is extended to and from Lyss to provide a connection also with the Lyss—Payerne line for Fribourg and Lausanne.

AUSTRIA

Decline in Traffic

The economic recession in Austria is reported to be having an adverse effect on the traffic of the Federal Railways. While the volume of Austria's foreign trade for the first half of 1958 was 5½ per cent short of that for the same months in 1957, the number of wagon loadings was 3·6 per cent lower, and *tonne*-k.m. fell by 10·8 per cent. This resulted in a reduction of traffic receipts by 5·2 per cent.

Publications Received

Pressed Steel Company Limited.—This well produced publication describes the expansion of the Pressed Steel Co. Ltd. over the past 30 years. The original company, Pressed Steel Co. of Great Britain Ltd., was formed in 1926 to apply patented techniques for pressing steel sheet and for welding, developed by the Edward G. Budd Manufacturing Company of Philadelphia. With the withdrawal of the American interest in 1935, the company became completely British owned and operated. The development of the enterprise is outlined and illustrated with graphs and colour plates. For the benefit of overseas readers it is summarised in seven languages.

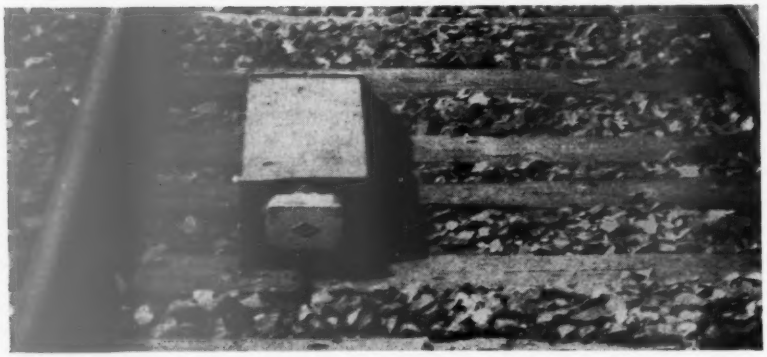
India's Life Line. New Delhi; Ministry of Railways, Government of India. 12½ pp. 9½ in. × 7 in. Paper covers. No price stated.—This booklet contains statistics showing the remarkable development of Indian railway traffics since 1950. For instance, during the three years to 1956-57 the ton-mileage rose by 40 per cent. The scope of the Second Five Year Plan activities is also outlined; in March, 1958, 750,000 engineering personnel were employed on works of all kinds undertaken under the plan. These works include 1,450 miles of new electrification, 842 miles of new railway, and 1,600 miles of line-doubling. The Indian railways now run 4,400 passenger and 2,900 goods trains daily, covering 562,000 miles. They maintain 10,000 locomotives, 24,000 coaching vehicles and nearly 283,000 wagons. These are a few of the facts mentioned in this useful statistical summary; others are referred to in an editorial note in this issue.

Railway Commercial Practice: Supplement No. 2. By H. F. Sanderson. London: Chapman & Hall, Limited, 37, Essex Street, W.C.2. 8¼ × 5¼ in. 8 pp. Obtainable free from the publisher.—Volumes 1 and 2 of the comprehensive and informative textbook by Mr. Sanderson, who is Assistant Commercial Officer of British Railways, North Eastern Region, appeared respectively in March and December, 1952. Supplement No. 1 was published in 1955. This second supplement deals specifically with changes in the organisation of the B.T.C. and of British Railways, and with the Merchandise Charges Scheme which came into force on July 1, 1957. A great deal of ground is covered, and the information is clearly set out. It includes the new traffic organisations in five Regions, the Contracts Department at B.T.C. headquarters, alterations in Regional boundaries, increases in rates and fares, and an admirable summary of the Merchandise Charges Scheme and its implications.

Calendars for 1959.—We have received calendars for 1959 from J. Stone & Co. (Deptford) Ltd.; Canadian Pacific Railway; D.P. Battery Co. Ltd.; Permali Limited; Netherlands Railways; Le Tourneau-Westinghouse Company; Brown Boveri & Co. Ltd.; Talyllyn Railway Company; Railway Passengers Assurance Company; and Spoorweg Sein Industrie N.V.

A.T.C. Experiments in India

Interference experienced in tests with contact and inductive equipment on 5-ft. 6-in. gauge lines



Hudd type track inductor used experimentally on the Bombay, Baroda & Central India Railway

REFERENCE was made on page 507 of *The Railway Gazette* of October 24 to experiments with A.T.C. on Indian railways. Some of these are described below, and show some of the difficulties encountered in Indian conditions. The tests were on 5-ft. 6-in. gauge lines. The problem of clearance would be greater on metre-gauge lines.

In 1946 a committee of certain heads of departments, including the Chief Signal Engineers, of the then Great Indian Peninsula and Bombay Baroda & Central India Railways, with the General Manager of the latter, Sir George Cuffe, as chairman, conducted experiments and reported on the feasibility of introducing A.T.C. in India. After considering several systems, it was decided to apply the Hudd equipment on the B.B.C.I.R. and another inductive system, manufactured by the General Railway Signal Company of America, on the G.I.P.R., on an experimental basis in both cases.

Sir George Cuffe decided that his own railway should itself experiment with a contact type of equipment, similar to that in use for many years on the Great Western Railway, but with the ramp outside the track and not in the centre, the contact shoe being mounted on the side of the locomotive tender. The ramp was to be energised in accordance with the relevant signal aspects, in the same way as in the G.W.R. system, being dead when the signals were at "stop," in which condition both audible and visual indications were to be given in the engine cab.

The other indications corresponded with the home arm "off" and warner below "off," and with both arms "off." The audible indication was an electric bell with a signalbox type repeater to give red, yellow and green aspects in conjunction.

It was soon discovered that the contact shoes on locomotive tenders were being damaged by some infringement of standard clearance dimensions, and the difficulty was to ascertain if this occurred at one place only or at several. The locomotives concerned were mainly on the Bombay-Ahmedabad run, 300 miles. An intensive campaign was launched and all lineside features, such as signal posts, fittings, platforms, and other equipment were checked with the schedule of standard dimensions. Permanent way inspectors' trolleys were fitted with special templates to the exact gauge of the contact shoe in position on a tender, so as to check all lineside equipment. Despite this, damage continued and attention was then turned to possible temporary or mobile infringements. These were found to be caused by permanent way staff working on the track resting their tools by driving them into the ballast so that they remained in an upright position. These obstacles disappeared when the men left the site, so that the actual position could never be located. In due course it was decided to abandon this experiment on the B.B.C.I.R., and the equipment was transferred to the then Madras & Southern Mahratta Railway, where exactly the same experience was encountered.

Inductive Equipment

When the Hudd equipment was received from the United Kingdom the receiving portion was fitted to an "H" class engine, No. 561, at the Parel shops, while the Signal Department fitted a pair of inductors on the down through line at Elphinstone Road, on the B.B.C.I.R. Bombay suburban section. On July 7, 1949, trial runs were made, with complete success.

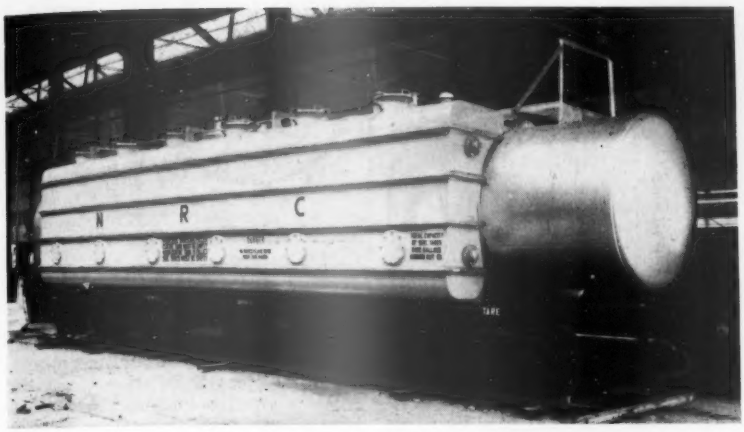
As a result it was decided to install the rest of the equipment obtained for experiment on the main line. Arrangements were made to equip five locomotives and 10 stations on the B.B.C.I.R. main line between Bulsar and Surat and beyond. The position selected for the permanent and electromagnetic inductors was half a mile on the approach side of the outer-warner

(*Continued on page* 776)

Experimental contact ramp on Bombay, Baroda & Central India Railway

Dual-Purpose Tank Wagons in Nigeria

Movement of high flash-point oils inland, with return loads of groundnut oil



Bogie wagon with cylindrical tank for mineral oil and panniers for return loads of groundnut oil, showing panniers resting on side sills of underframe

TO avoid empty working of tank wagons conveying high flash-point mineral oils from Lagos north to Kano, about 700 miles, when there is a traffic of groundnut oil in the opposite direction, the Nigerian Railway Corporation considered various expedients. No wagon existed suitable for immediate alternate conveyance of these oils. Consideration was given to plastic bags which could be inserted in a tank for conveying groundnut oil southbound. No bag could be found which was impervious to either kind of oil and was otherwise suitable for handling. Expendible bags were not practicable.

Mr. R. K. Innes then Chief Mechanical Engineer and now General Manager, Nigerian Railway, initiated a design for the 3-ft. 6-in. gauge of a vehicle with cylindrical tank for mineral and panniers for return edible oil traffic, illustrated in our July 18 issue. With a view to a satisfactory payload of both oils, restriction of tare weight to a minimum was an important consideration. On this basis, an invitation to tender was issued by the Crown Agents for Oversea Governments & Administrations. The design proposed by the Société Métallurgique d'Enghien St. Eloi, was taken into consideration. An order for 10 vehicles was subsequently placed by the Nigerian Railway Corporation and executed at the builders' works at Manage, Belgium.

The 10 vehicles have been running in Nigeria for some months. The management of the railway is reported to be awaiting the results of operation over a period before arriving at a decision on the extent to which the design has proved successful, and whether further vehicles of this type should be obtained.

The wagons consist of: (*a*) a centre cylindrical tank of the conventional type, of steel, for carrying mineral oils with a high flash-point; and (*b*) two pannier tanks of aluminium alloy overhanging the centre tank on both sides, suitable for edible oil. This arrangement is shown on the cross-section diagram on page 772.

Principal dimensions are as follow:

	ft. in.
Gauge	3 6
Length overall	46 1
Distance between bogie axles ..	29 6
Width overall	10 0
Height above rail level	12 9½
Dia. of cylindrical tank	6 0
Length over ends of centre tank ..	42 8
Length of side tanks	31 1½
Capacity of centre tank	7,400 gal.
Capacity of side tanks	5,990 gal.
Tare weight	23 tons 16 cwt.

The wagons are equipped with " A.3 " Ride Control two-axle bogies of Davis & Lloyd design, equipped with Hoffmann axleboxes with two rows of cylindrical roller bearings.

In the underframe the centre solebar is composed of rolled steel sections. The solebar with the cylindrical tank constitutes the bearing component. The weight of the side sills, built of steel plates, bent to form a sufficiently wide support for the pannier tanks, is borne by the solebar through outriggers. The underframe components were assembled by electric arc welding.

The wagons are fitted with A.B.C. non-shock couplers; steel buffing springs, and rubber draw-springs; vacuum and hand brakes. An automatic slack adjuster is also provided.

Cylindrical Tank

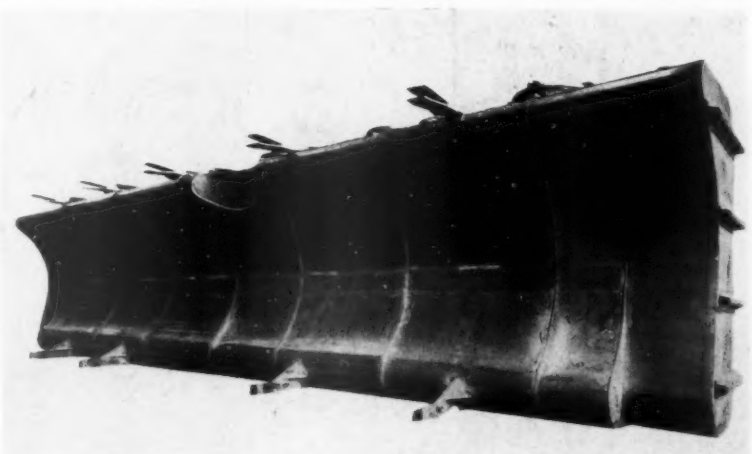
The cylindrical tank is composed of five shells of steel plates of a thickness of 29/64 in. at the bottom and of $\frac{11}{32}$ in. at the top. These shells were assembled with 29/64 in. thick dished ends by submerged arc welding on an automatic Lincolnweld welding machine. The longitudinal seams were executed in the same way. The weld seams were systematically checked by X-ray. Each tank was hydraulically tested under a pressure of 60 lb. per sq. in.

Five baffle-plates are fitted inside the tanks. There are also a dome provided with a manhole and containing normal safety-devices, discharge valves, and a loading bar indicating the maximum level not to be exceeded with liquid, whatever the specific gravity of the mineral oil carried may be.

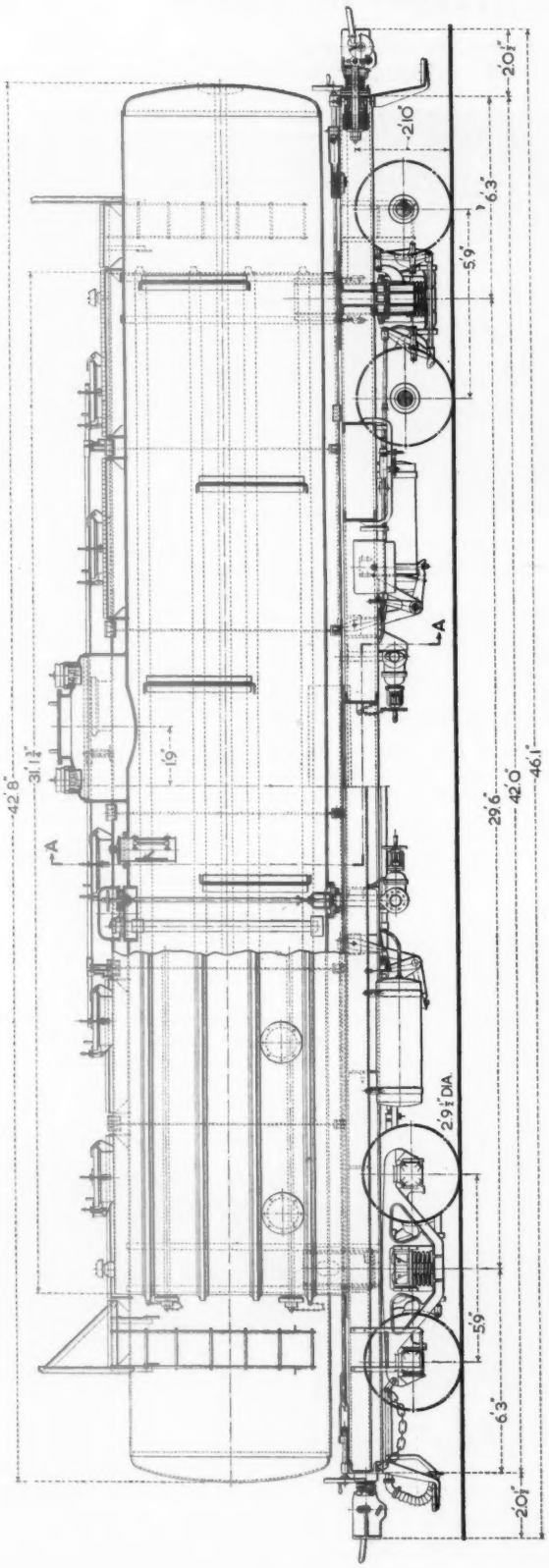
The centre tank rests loose on the underframe main cross-girder, so that a free expansion is possible. It is held in position with steel straps and attached to the underframe by means of longitudinal stiffening fasteners fitted in its bottom.

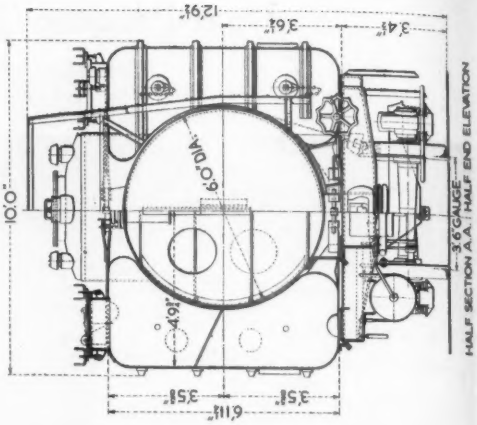
Pannier Tanks

In the side tanks, it was considered essential to have a dead load as low as possible, so as not to affect appreciably



Aluminium alloy side tank before assembly on centre tank, showing tie-rods, also horizontal tighteners extended on end heads





Elevation and section of dual-purpose 3-ft. 6-in. gauge tank wagon, showing dimensions and relative positions of cylindrical and pannier tanks, and method of attachment to underframe

the quantity of liquid to be carried in the centre tank and on the other hand, to limit the length of the vehicle, to comply with the loading gauge, and to have a low centre of gravity. The dead load was minimised by constructing the pannier tanks of light alloy. The capacity of the mineral oil tank is little reduced by the necessity to attach the panniers.

In comparing the new vehicles with the existing Nigerian Railway standard mineral oil tank wagon, both weighing 50 tons loaded, it must be noted that the reduction of capacity was from 9,000 gal. for the standard wagon to 7,400 gal. for the dual-purpose tank wagon.

The side tanks of welded construction were constructed from plates and extruded sections of aluminium alloy, Belgian grade Sidal 4 CR, 1/4 hard.

Construction of Side Tanks

Each side tank consists of four shell components of 0.24 in. thick straight and curve plates, each composed of several butt-welded sections. These components are joined together to form the actual shell of the tank, walled up, at each end, with flat heads welded at right angles. The stresses in this angle weld are considerably reduced by the addition of one forged angle-piece welded both to shell and heads.

The side tank takes no weight. It rests on the side sill of the underframe and it is leant laterally on the centre tank. It must withstand the weight of the liquid inside and its surge and any irregularity of the track. The vertical face of the tank is strengthened by five baffle plates with their peripheral edges welded to the shell. Four rows of horizontal tighteners of extruded sections, resting on these baffle-plates are also strengthening the vertical shell plates. These tighteners are extended on the end heads.

The side tanks are fixed to the centre tank by means of nine tie-rods with tighteners fitted on the top and bottom faces. This arrangement is clearly shown in the illustration on page 771. The advantages of this arrangement are a possible free expansion and an easy removing of one of the side tanks for

maintenance purposes without disturbing the centre tank.

The aluminium alloy components were assembled by argon welding either with refractory electrodes or with fusible electrodes of the same nature as the base metal. In this latter case, according to the position and nature of the assemblings, the weld seams were effected by hand or on an automatic welding machine.

Each tank was hydraulically tested under a pressure of 6 lb. per sq. in.

For the filling of the tank and an easy inspection in cleaning, six 1-ft. 6-in. dia. manholes with a lock-up flap cover have been provided at the top. At the bottom there are six 1-ft. dia. inspection holes with bolted cover, through which spraying tubes can be inserted into the tank for cleaning purposes.

As edible oil is carried, much attention was given to arrangements for cleaning. The inside of the panniers is free from sharp edges and protuberances. To prevent any gap between plates which would be impossible to wash, and to eliminate mustiness in the oil, the weld seams were executed both outside and inside the tanks.

Cleansing Tubes

Two perforated cleansing tubes are fitted inside each tank and run the whole length. These tubes are connected by hose to pressure water supply for cleaning. The oil discharge pipes have distinct flange dimensions to preclude incorrect discharge connection between the two kinds of oil.

Balanced distribution of liquid in both side tanks is secured by an equalising pipe. This is provided with a hose for absorbing the slight difference of liquid which is due to expansion.

For protecting the surfaces in contact, strips of balata are inserted between the aluminium alloy tanks and the steel components such as the side sills and centre tank.

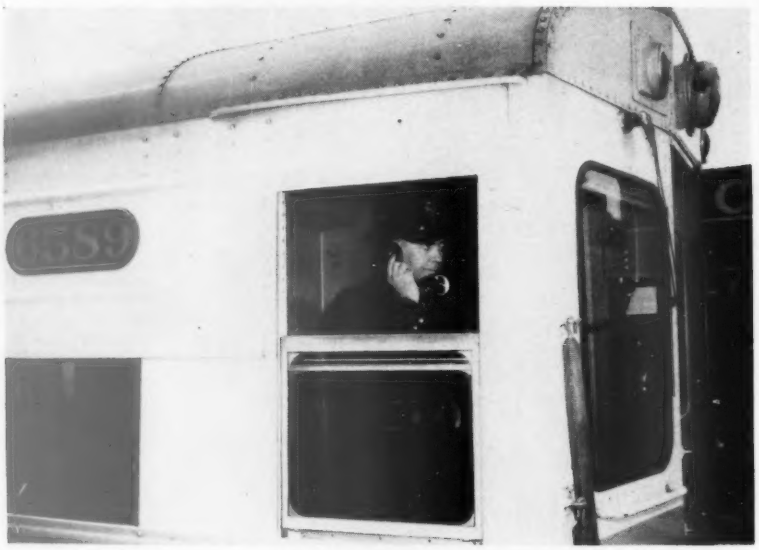
Top view, showing method of attaching panniers to cylindrical tank

Progress at Margam Marshalling Yard

Sorting sidings at Margam Marshalling Yard, Port Talbot, British Railways, Western Region, about 95 per cent complete (see our issue of June 20, 1958)

Train Communication on the Chicago Transit Authority

Experimental frequency-modulated power carrier equipment



Motorman speaking with Line Supervisor's office from cab of train, showing control box through front window of cab

AN experimental train telephone communication system has been installed on the North-South route of the Chicago Transit Authority. Six cars have been equipped with two-way communication equipment. This equipment is frequency-modulated power carrier, designed to operate over d.c. power distribution systems. The power output is some 30 W. and operates at a frequency of 85 kc/s. The unit is portable and weighs about 27 lb. This transmitter-receiver unit includes a hand-set, speaker, and transistorised power supply.

Layout

Five fixed transmitter-receiver stations are located along the North-South route, and 25 impedance bonds are connected to the third rail at intervals along the line. These impedance bonds, known as "Z" boxes, are also connected to telephone lines in the Authority's own private telephone cable.

These telephone lines, called primary circuits, are used to carry the radio frequency energy between the fixed transmitter-receiver stations and the third rail. There are also five secondary telephone line circuits carrying voice frequency communication between the Line Supervisor's office and the fixed transmitter-receiver stations.

Operation

The fixed transmitter-receiver in the Line Supervisor's office has three switches adjacent to the handset; each controls a section of the North-South line. By operating the switches it is possible to speak to each of the sections individually or in groups of two or three.

To call a train operating on the line, the switch for the particular section is operated. The hand-set is then used in the same manner as a telephone handset, except that there is a button on the set which must be depressed when talking.

The voice is carried over a telephone line to a fixed wayside transmitting station. There the voice energy is changed to a radio frequency FM signal and is fed to a telephone line which extends along the length of track. At approximately every mile the radio frequency energy is tapped off and applied between third rail and ground through the impedance bonds. Any train operating in this area would then receive this radio frequency signal through the third rail shoes, and the receiver on the train would transform this energy back to voice.

Public Address System in Train

If necessary the Line Supervisor can speak directly to the passengers on the train over the train public address system by instructing the motorman to operate a switch in the cab.

When the motorman of the train wishes to talk to the Line Supervisor he lifts his receiver, operates the button on the hand-set, and talks as he would in an ordinary telephone. The voice and radio frequency energy are then transmitted to the headquarter office.

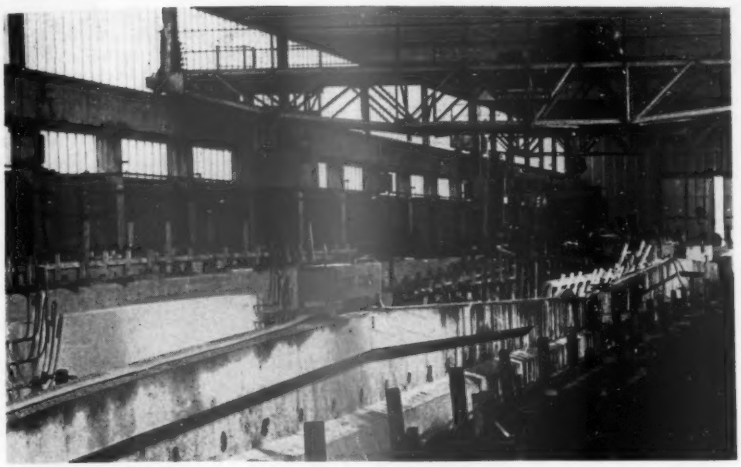
The equipment was manufactured by Femco Incorporated of Irwin, Pennsylvania, U.S.A.

Control box and switches in the Line Supervisor's office

NEW INTERNATIONAL TOURIST TICKET.—American tourists in Europe will benefit from a special type of international tourist first class ticket, to be known as "Eurailpass," which will be available as from January 1, 1959, for travel on the railways of 13 countries which adhere to the special convention governing the ticket. The price is $125. The holder is entitled to any number of trips on any railway in the 13 countries for a duration of two months. The Eurailpass is available only to visitors from North, Central, and South America.

Bridge Reconstruction at Pontnewynydd, Western Region

Partial bonding reduces contruction depth in pre-tensioned concrete beams



Some of the bridge beams on the pretensioning bed

HILL STREET BRIDGE, Pontnewynydd (Monmouthshire), over the Blaenavon branch of the Western Region of British Railways, was reconstructed and widened during the summer of 1958. The old bridge, built in 1854, had a span of 38 ft. and crossed the railway on a slight skew. It consisted of longitudinal cast-iron beams carrying timber decking and a roadway only 18 ft. wide.

The new bridge, with a span of 61 ft. between centres of bearings and crossing the railway at an angle of 45 deg., carries a 30-ft. carriageway and two 7-ft. 6-in. footpaths. It is built of 24 longitudinal inverted tee-shaped beams of prestressed concrete with *in-situ* fill and transverse mild-steel reinforcement. The beams are 2 ft. 9 in. deep at the centre and taper to 1 ft. 10½ in. at the ends to ease the gradients on the road. Excluding 3 in. of tarmac surfacing, the depth of construction at the middle is 3 ft. 1 in. or about $\frac{1}{20}$ of the span.

Site Considerations

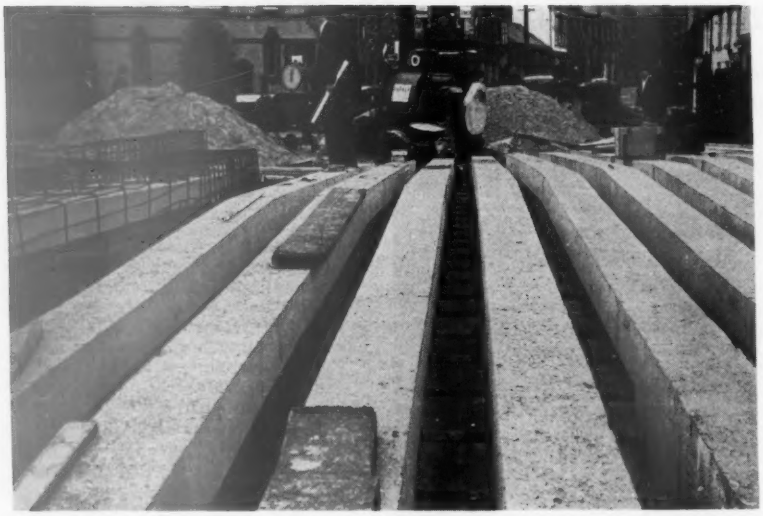
The site is an awkward one, and it was impossible to use precast post-tensioned beams because of their weight and the fact that in the erection only one 45-ton breakdown crane could be manœuvred into position, and that would have been insufficient to lift the beams. In the ordinary way, precast Hoyer beams made on the long-line pre-tensioning system would have required considerably more depth to keep down to permissible limits the horizontal and shear stresses, due to pretensioning with straight wires. However, by sleeving some of the wires in P.V.C. (polyvinyl chloride) tubing over lengths varying between 12 ft. 3 in. and 15 ft. 3 in. from the ends of the beam, and preventing bond with the concrete over these lengths, it has been possible to develop sufficient prestress at the middle of the span without the risk of splitting the beams horizontally through excessive sheer at the ends. In this way it was also possible to build these beams with a depth at the centre of only $\frac{1}{22}$ of the span. In accordance with Western Region practice the beams are designed to carry full live load without subjecting the bottom fibres of the beams to any tension.

Pretensioning Method

Each beam was pretensioned with 146 high-tensile steel wires, 0·2 in. in dia.—with a minimum ultimate strength of 110 tons per sq. in.—stretched under a load of 5,032 lb.; of these wires 28 were partly bonded. The concrete in the beams had a minimum seven-day crushing strength on a 4-in. cube exceeding 7,000 per sq. in. The situ-poured concrete. reinforced transversely with mild steel—equivalent on the cross sectional area to 0·5 sq. in. per ft. run of the span—had a minimum strength of 5,000 lb. per sq. in. at the same age.

The effectiveness of the partial bonding was confirmed by tests. Wires 0·2 in. in dia. sleeved throughout a 13-ft. long beam, identical in cross section and quality of concrete with the

The bridge during erection, showing the old bridge in the background



The beams after erection showing the mild steel bars for transverse distribution

beams for the bridge, pulled out under a force of less than 24 lb. per ft. run, indicating a negligible bond. Another wire sleeved over 12 ft. 9 in. and having a bond length of but 9 in. required a force of no less than 6,000 lb. to extract it.

Design Strength

In another test the behaviour of a 30-ft. beam 19 in. deep and 2 ft. 4 in. wide designed to carry underbridge loading showed that the design strength was not diminished by partial bonding. In this beam a prestressing force of 442·4 tons was applied through 197 wires 0·2 in. in dia. Ninety-two of the wires were covered with P.V.C. sleeving at the ends for lengths varying from 1 ft. 9 in. to 6 ft. The maximum compressive stress at the end of this beam was 1,242 lb. per sq. in. At the centre it was 3,176 lb. per sq. in.

Tests to Destruction

During this test at Taunton Concrete Works a load of 22·5 tons was applied by two jacks equidistant 2 ft. from the centre of the beam; this was equivalent to the full design load on the beam. On release there was no residual deflection, the beam returning to its original camber. On the load being increased, strain-gauge measurements showed that the first cracking on the underside of the beam occurred under a load of 36 tons. At this point the extreme fibre stress was 840 lb. per sq. in. in tension. Upon the load being further increased to 52 tons the first visible crack, 0·1 mm. wide appeared, as measured with a Brinell microscope. On release, recovery was again complete after 3½ min Ultimate failure occurred through the crushing of the concrete under a load of 74 tons. Under this load the compressive stress was 8,956 lb. per sq. in., a figure comparing very closely with 9,030 lb. per sq. in. obtained through cube tests. The readings taken during the tests showed that the concrete had a modulus of elasticity of $7{\cdot}9 \times 10^6$ lb. per sq. in.

The bridge was designed in the Steelwork Office of the Civil Engineering Department at Paddington and under the direction of M. G. R. Smith, Chief Civil Engineer, Western Region. It meets the requirements of the Ministry of Transport.

The beams were made by the Concrete Development Co. Ltd. at Iver, Bucks, who also carried out the extraction tests demonstrating the lack of bond in sleeved wires.

The mild steel reinforcement for one of the service ducts

A.T.C. Experiments in India

(*Concluded from page* 770)

signal. The district selected was a well-populated agricultural area. Further north the country was less densely populated, but within a few days of the track equipment being installed, battery cupboards were broken open and the batteries and relays stolen. The inductors were prised up and removed. There was some delay in the fitting of the receiving equipment to the locomotives, caused by other difficulties, and all the track equipment had to be removed and stored for safety until the Locomotive Department's side of the work was ready.

Regular Experiments

Trial working was eventually begun. Great difficulty was experienced, but the failures which occurred were attributable entirely to action by outside parties and not to the efficiency of the apparatus itself. Proper indications were not given as they should have been, for example, because the batteries had been stolen or the track inductors themselves interfered with. The locomotives also were not free from interference and parts of the receiving equipment were stolen while they were in the sheds. The experiments were abandoned. No further action is reported to have been taken.

LUGGAGE LOCKERS AT LEICESTER SQUARE STATION.—A bank of 64 sixpence-in-the-slot luggage lockers was brought into use at Leicester Square underground station on December 12.

RAILWAY NEWS SECTION

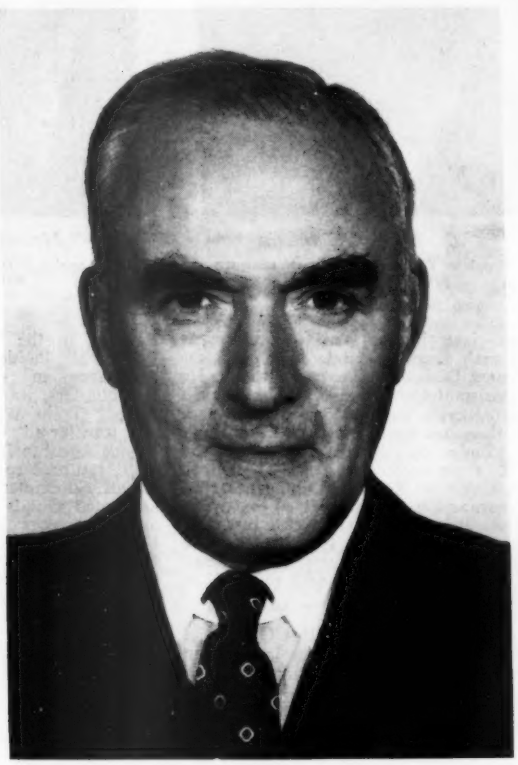
PERSONAL

Mr. A. E. Moyle, Assistant Chief Traffic Manager (Operations), Perth, Western Australian Government Railways, has been appointed Chief Traffic Manager. He succeeds Mr. T. W. Brodie, who is on retirement leave.

Mr. J. Taylor Thompson, M.C., M.I.C.E., J.P., Chief Civil Engineer, London Midland Region, British Railways, who, as recorded in our August 29 issue retires next week, received his early technical training on the former North Eastern Railway at Newcastle-on-Tyne. He was engaged later principally on new works and was closely associated with the development of coal-shipping facilities on the North East Coast. After the 1914-18 war, during which he was in command of a Royal Engineers' Section attached to the Royal Artillery, he carried out under-pinning work on the foundations of Newcastle high-level bridge, and other works in that area. He moved to York, in 1925, as Personal Assistant to the Engineer, and was later Assistant to Engineer, when he was concerned with organisation and new works. These included the widening of the main line between York and Northallerton, and the new inward goods yard at Hull. He was appointed District Engineer, Darlington in 1935, and, at the end of 1936, became Assistant Engineer, North Eastern Area. In 1942, Mr. Taylor Thompson was appointed Engineer, York, and he became Civil Engineer, North Eastern Region, on nationalisation in 1948. In May, 1951, he was appointed Civil Engineer, London Midland Region, a position re-designated Chief Civil Engineer in January, 1955. He was Chairman of the Yorkshire Association of the Institution of Civil Engineers in 1939-40, and twice was awarded the Trevithick Premium of the Institution; for papers on high speed track, and on the layout of locomotive depots. He was President of the Permanent Way Institution, 1948-49. Mr. Taylor Thompson was Chairman of the committee that designed the present flat-bottomed track adopted by British Railways in 1948. He has been, for many years, a representative of British Railways, and the Institution of Civil Engineers, on British Standards Committees on Railway Rails and other railway engineering matters. More recently he has been Chairman of the Civil Engineering Committee, British Railways, and has represented the Chief Civil Engineers at meetings with their continental officers. Mr. Taylor Thompson is President of the Railway Mission, the British Railways Temperance Union, and the Railway Service Christian Union. He regularly presides at the London meetings of the Railway Service Christian Union, which is his especial interest, and has just been re-elected to continue his presidency of that body after retirement.

Mr. A. N. Butland, O.B.E., B.A., B.Sc.(Eng.), M.I.C.E., Assistant Civil Engineer, London Midland Region, who as recorded in our August 29 issue has been appointed Chief Civil Engineer takes up his duties next week. Mr. Butland was educated at Truro School and London University, graduating with first-class Honours in Engineering, after taking an Arts degree. He joined the staff of the Chief Engineer, Great Western Railway, in 1924 and, after six years on the design and survey of steel bridges, was transferred to the Divisional Engineer's staff at Cardiff. In 1935, Mr. Butland returned to Paddington and, under the Assistant Engineer, New Works, had charge of the location work and preparation of contracts for a new line in Cornwall. Three years later he became Assistant Resident Engineer, and afterwards Resident Engineer, for the quadrupling of the North Acton electrified lines from Greenford to Ruislip. During the 1939-45 war Mr. Butland served with Railway Construction & Maintenance Units from 1939 until 1945. He was awarded the O.B.E. for services in North-West Europe, was mentioned in despatches, and holds the Emergency Reserve Decoration with first clasp. Mr. Butland was appointed Assistant Divisional Engineer, Taunton, in 1940 and took up this position on demobilisation. In 1947 he became Assistant (Maintenance) to the Chief Engineer, an appointment covering both permanent way and works.

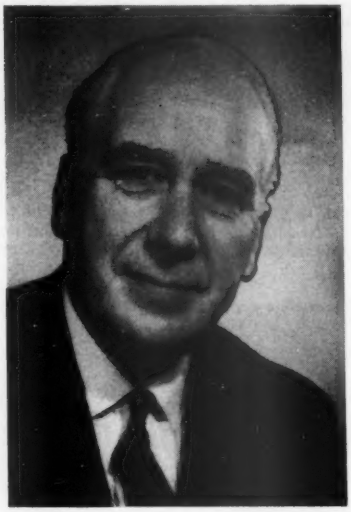
Mr. J. Taylor Thompson
Chief Civil Engineer, London Midland Region, who has retired



Mr. A. N. Butland
Appointed Chief Civil Engineer, London Midland Region

Mr. H. E. R. Bastin

Appointed District Traffic Superintendent, Bristol, Western Region



Mr. H. E. Hallett

Appointed Operating Officer, Bristol, Western Region

Mr. N. S. Taylor

Appointed Commercial Officer, Bristol, Western Region

A year later he returned to Taunton as Divisional Engineer and, in 1949, was appointed Divisional Engineer, Bristol. He was Assistant Civil Engineer of the North Eastern Region from 1952 until 1955 and, since then has been Assistant Civil Engineer, London Midland Region. He is the B.T.C. representative on the European Study Circle on Tunnel Maintenance, and this year, as Chairman, received the Circle in Great Britain. On October 1 last, Mr. Butland was transferred from the Reserve of Officers, Royal Engineers, to the Engineer & Staff Corps, T.A., with the rank of Major.

Mr. H. E. R. Bastin, M.Inst.T., District Commercial Manager, Bristol, Western Region, British Railways, who, as recorded in our December 5 issue, has been appointed District Traffic Superintendent, Bristol, joined the former Great Western Railway in the Chief Goods Manager's Office at Paddington in 1917. After experience in various departments at headquarters, was placed in charge of the Freight Train Working Section in 1941. He transferred to Bristol as Assistant Goods Agent in July, 1945, and, 15 months later, returned to Paddington as Assistant Goods Superintendent. In 1948 he was appointed Goods Agent, South Lambeth, and two years later transferred to the Eastern Region, at Liverpool Street, as Goods & Parcels Terminals Assistant to the Chief Commercial Manager. In 1954 he returned to the Western Region as District Commercial Manager, Cardiff and was appointed to his present post of District Commercial Manager, Bristol, in March, 1957. Mr. Bastin represents the B.T.C. on the South Western Area Transport Users' Consultative Committee; South Western Regional Board for Industry, and the Council of the Bristol Chamber of Commerce & Shipping. He is also a Director of the Bristol Omnibus Co. Ltd., Bath Tramways Motor Co. Ltd., Bath Electric Tramways Limited and Cheltenham District Traction Co. Ltd.

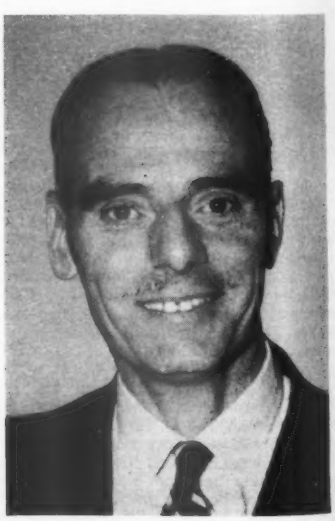
Mr. H. E. Hallett, District Operating Superintendent, Worcester, who, as recorded in our December 5 issue, has been appointed Operating Officer, Divisional Traffic Manager's Office, Bristol, began his railway service with the former Barry Railway. In 1922 Mr. Hallett was transferred to the Divisional Superintendent's Office, Cardiff, former Great Western Railway. In 1927 he was transferred to the Office of the Superintendent of the Line, Paddington. In 1936 Mr. Hallett went to New York, as the British & Irish Railways' Travelling Representative in America. On return-

Mr. A. A. Masey

General Passenger Agent in Europe, C.N.R., 1953-58

Mr. C. G. Thearle

Appointed General Passenger Agent in Europe, C.N.R.



Mr. G. C. Bonell

Appointed District Passenger Agent, London, C.N.R.

ing to England in 1939, he became an assistant to the Divisional Superintendent, Paddington, and in June, 1941, was appointed Chief Clerk to the Divisional Superintendent, Chester, becoming Assistant Superintendent the following year. He moved to Bristol as Assistant Divisional Superintendent in 1949, and was appointed District Operating Superintendent, Worcester, in 1956.

Mr. N. S. Taylor, A.C.I.S., M.Inst.T., Assistant (Claims & Salvage) to the Commercial Officer, Western Region, British Railways, Paddington, who, as recorded in our December 5 issue, has been appointed Commercial Officer, Divisional Traffic Manager's Office, Bristol, joined the former Great Western Railway at Plymouth in 1922. Mr. Taylor transferred, in 1935, to the Development Section, Chief Goods Manager's Office, Paddington. In 1942, he was seconded for outdoor duties in connection with terminal working, rolling stock and bonus matters. Two years later, he became Chief Clerk of the then newly-formed Post-War Planning Section. He was responsible for the development of Zonal Collection & Delivery Schemes, being Chairman of the Inter-Company Sub-Committee. He was also Chairman of the Great Western-Southern Railway working Committees on co-ordination of freight facilities at Reading, Exeter and Salisbury. On the formation of the Railway Executive, Mr. Taylor was appointed Assistant to the Executive Officer (Special Duties) and was engaged on the co-ordination of railway facilities, freight and parcels, in the London Area. In 1953 he became a Traffic Costing Officer, attached to the British Transport Commission and, in 1954, was appointed to the position he now vacates. In 1951 Mr. Taylor received the B.T.C. Award for a paper entitled "Some London Freight Problems." He has been a member of the Council of the Institute of Transport and for two years occupied the Chair of the Berks, Bucks & Oxon Section. He is also an associate of the Institute of Taxation and of the Industrial Transport Association.

Mr. Arthur A. Masey, General Passenger Agent in Europe, Canadian National Railways, who, as recorded in our October 31 issue, has retired, was born in London and joined the Passenger Department, Canadian National Railways, in 1924. He was appointed District Traffic Agent, Southampton, in 1950, and Traffic Agent, London, in 1952. Mr. Massey became General Passenger Agent the following year.

Mr. Geoffrey C. Bonell, Chief Clerk, London, Canadian National Railway, who, as recorded in our November 14 issue, has been appointed District Passenger Agent, London, started his career with the C.N.R. at Cardiff in 1927. Mr. Bonell transferred to Liverpool, in 1947, and worked in the Passenger, Freight and Express departments. He moved to London, in 1953, as Passenger Travelling Representative, and, three years later, he was promoted to be Chief Clerk.

Mr. Cecil G. Thearle, District Passenger Agent, London, Canadian National Railways, who, as recorded in our October 31 issue, has been appointed General Passenger Agent in Europe, began his railway career in the European Manager's Department of the C.N.R. in 1923. The following year he was transferred to the Freight Department, where he served until his appointment to the City Traffic Office in 1930. In 1946 he returned to Head Office, and was appointed to the passenger department where, in 1950, he became Travelling Passenger Representative. In 1952 Mr. Thearle was appointed Chief Clerk to the General Passenger Agent, and he became District Passenger Agent, London, in 1956. He will have his headquarters in London.

Mr. C. Williams, Assistant District Traffic Superintendent, Exeter Central, Southern Region, British Railways, has been appointed District Traffic Superintendent, Exeter Central.

Mr. G. Shrimpton, District Engineer, New Zealand Government Railways, has been appointed a member of the Institution of Civil Engineers.

Mr. A. A. G. Mackintosh, a senior engineer, Messrs. Rendel Palmer & Tritton, has been appointed a member of the Institution of Civil Engineers.

Mr. D. S. Davies, Head of Terminals & Cartage Section, Office of the Line Traffic Manager (Great Northern), Kings Cross, Eastern Region, British Railways, has been appointed Assistant, Line Traffic Manager's Office (South Eastern Division), London Bridge, Southern Region.

We regret to record the death, on December 15, after a prolonged illness, of Sir Jackson Millar, Chairman of Albion Motors Limited, and a director of Leyland Motors Limited, and of Scammell Lorries Limited, as well as a number of other companies.

Sir Frederick Handley Page, a Vice-President of the City & Guilds of London Institute, has been re-elected Chairman of the Institute's Council. Brig.-General Sir Harold Hartley, Mr. Arthur M. Holbein and Sir George Nelson have been appointed Vice-Presidents of the Institute. Professor R. S. Hutton, a Vice-President, has been elected Vice-Chairman of the council.

We regret to record the death on December 19, at the age of 83, of Mr. A. J. Trewren, Stationmaster, Cannon Street, Southern Railway, from 1933 to 1938. Mr. Trewren joined the South Eastern Railway, as a clerk in 1890, at Wokingham. He subsequently became Stationmaster, Appledore, Assistant Stationmaster, Victoria, Stationmaster, Woolwich, and Stationmaster, Woking.

Mr. G. D. Collins, Stationmaster, Torquay, Western Region, British Railways, has been appointed Stationmaster at Exeter St. David's, Western Region. Mr. Collins joined the former Great Western Railway at Keyham in 1919, subsequently transferring to Saltash and, later, to Plymouth Mill Bay. In 1925 he went to Camborne as a booking clerk, in which capacity he served until 1930, when he returned to Plymouth to serve in the General Section of the Divisional Superintendent's office, later re-designated District Traffic Superintendent's Office. In 1938 Mr. Collins was appointed Stationmaster at Ivybridge. He returned to the District Traffic Manager's Office at Plymouth in 1941 to become head of the New Works Section. At that time, he also was the Deputy Railway A.R.P. Officer for the Plymouth Area. He became Stationmaster at Torquay in 1950.

Mr. R. E. Gardiner has been appointed London Manager, Alldays & Onions, Limited, in succession to Mr. R. J. Nash.

Mr. G. C. R. Eley has resigned from the Board of the Hawker Siddeley Group. Mr. Eley has joined Richard Thomas & Baldwins Limited, as an additional deputy chairman and will succeed Sir Ernest Lever as chairman in April, 1959.

Mr. Lewis Chapman, Chairman of William Jessop & Sons Ltd., has succeeded Sir Andrew McCance, Chairman & Managing Director of Colvilles Limited, as President of the British Iron & Steel Federation, Mr. Richard F. Summers, Chairman of John Summers & Sons Ltd., has been appointed President Elect of the Federation for 1959.

Mr. E. W. Stainton has been appointed Assistant Sales Manager, Switchgear Department, Metropolitan-Vickers Electrical Co. Ltd. Mr. D. R. Clegg becomes Assistant Sales Manager, Transformer Department; Mr. F. H. Davis, Assistant Superintendent, Foundries, and Mr. D. E. Thornhill, Assistant Superintendent, Transformer Department, Wythenshawe.

Mr. G. D. Elliot has been appointed Deputy General Works Manager, Appleby-Frodingham Steel Company, a branch of the United Steel Companies Limited, with effect from January 1. He will succeed Mr. J. D. Joy as General Works Manager on April 1, 1959. Mr. Joy has been appointed Deputy General Manager of the company from January 1. Mr. MacDonald will succeed Mr. Elliot as Works Manager.

The Institution of Locomotive Engineers

The following names have been entered on or transferred in the register of members of the Institution of Locomotive Engineers:—

Member

Mr. A. E. Hummeida, Chief Mechanical Engineer, Sudan Railways.

Associate Members

Mr. K. Das Gupta, Works Manager, North-East Frontier Railway, India.

Mr. J. Hope, Assistant to Works Manager for Finished Work Inspection, Locomotive Works, Crewe, London Midland Region, British Railways.

Mr. V. D. Sharma, Assistant Works Manager, Trade Testing, Railway Workshop, Jodhpur, Northern Railway, India.

Mr. J. L. Soni, Assistant Mechanical Engineer, Delhi Division, Northern Railway, India.

Graduates

Mr. J. C. Ansell, Draughtsman, D. Wickham & Co. Ltd.

Mr. K. V. Krishnamurthy, Assistant Mechanical Engineer, Central Railway, India.

Mr. K. R. P. Sarathy, Chargeman II, Tata Locomotive & Engineering Co. Ltd.

Transfers Associate Member to Member

Mr. H. E. Busby, Mechanical Engineer, Trinidad Government Railways.

Mr. G. C. Jackson, Chief Draughtsman, Birmingham Railway Carriage & Wagon Co. Ltd.

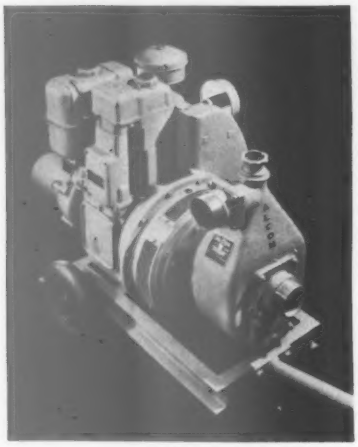
Mr. E. P. Lumley, Divisional Depot Engineer, London Transport Executive.

Mr. W. J. Wait, Works Manager, Cardiff Locomotive Workshops, New South Wales Government Railways.

Transfer Graduate to Associate Member

Mr. R. Slingsby, Diesel Engineer (Operations), Southern Railway of Peru.

NEW EQUIPMENT AND PROCESSES



High-Speed Self-Priming Diesel Pump

WITH a maximum output of 12,000 gal. per hr., the diesel-engine-driven Alcon 3-in. portable self-priming centrifugal pump set has many uses in civil engineering such as drainage work on railway sites, and it can also handle petrol, oil, and many other liquids.

Powered by a Lister L.D.1 air-cooled diesel engine developing 3·5 h.p. at 1,800 r.p.m., the pump is spigot mounted directly on to the engine crankcase, with an extension of the crankshaft carrying the impeller.

In temperate sea-level conditions, a typical intermediate performance is 7,000 gal. of fresh water per hr. against a total head, including friction, of 30 ft. and with 15 ft. suction lift.

Priming is by water re-circulation with adequate passages and a large chamber for the separation of air and water. There are no priming valves or moving parts contained in the priming system. A simple non-return valve of hard-wearing rubber, fitted to the inlet, ensures quick and consistent re-priming at suction lifts of up to 25 ft. The pump set is mounted on a bedplate which can also be fitted with a rubber-tyred two-wheel trolley. Price with wheels £165, without wheels, £155. The net weights are 406 lb. and 392 lb. respectively. Delivery is from stock.

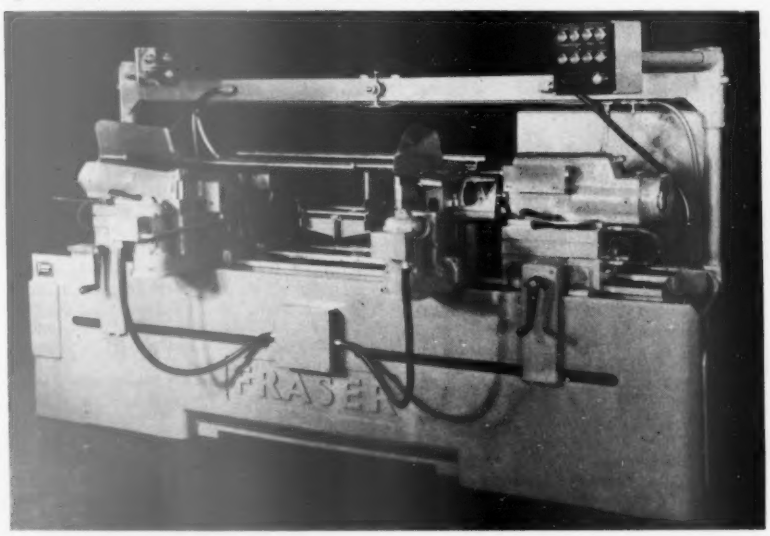
Further details, including performance data, may be obtained from Arthur Lyon & Co. (Engineers) Ltd., 6, Carlos Place, Grosvenor Square, London, W.1.

Tube Ending and Chamfering Machine

THE design of the Type SC2 tube ending and chamfering machine is based on that of Fraser ending and centring machines. Both sliding heads have rapid and fine adjustment for length setting. Each has a speed range of 314-1,105 r.p.m. through pick-off gears from its own 3-h.p. motor. The hydraulically operated quills have 3-in. travel. A self-contained valve on each head gives any rate of advance from rapid approach to coarse and fine feed.

Radiused jaws on the electro-mechanically operated vice unit prevent distortion of the tube, and air jets automatically remove swarf after release. Setting for various lengths of component is facilitated by attachment to vice units of the loader input and output carriages, which are gravity operated and fitted with a device which interrupts the cycle should the magazine be empty or a workpiece incorrectly loaded. The loaders are mechanical units and can be supplied with height of lift to suit specific diameters of tube. Workpieces are positioned endwise by a hydraulic locator which advances to a dead-length stop: a screw adjustor determines the amount of stock removed. Downtime is minimised by spare pre-set composite tool holders which can be held ready for mounting complete on to the spindle nose.

Further details, including price and delivery, may be obtained from the manufacturer, Douglas Fraser & Sons Ltd., Arbroath, Scotland.



Automatic Drill Sharpening Machine

A MACHINE for producing a correctly formed point on all types of right-hand drills from $\frac{5}{16}$ in. to 3 in. dia., which can be used by a semi-skilled operator, thus conserving skilled labour in large railway works and manufacturing plants, has already met with considerable success in the United Kingdom and U.S.A. The fully-automatic and hydraulically-operated Dormer drill sharpening machine can deal with drills having two, three, or four flutes ranging from straight to 40 deg. spiral, 90 deg. to 140 deg. point angles and lip clearances from 3 deg. up to 25 deg. A special tail-stock extension can be supplied for

drills of overall length greater than the normal maximum limit of 24 in. Dimensions of the base are 35 in. by 35 in., the height is 51 in., and the weight, 28 cwt. The grinding-wheel motor is 3 h.p. at 3,000 r.p.m., totally-enclosed type.

The design makes possible the fastest and simplest changing from one diameter to another, from one type of drill to another, from one length to another. In each instance, a true and uniform point is produced. Independent adjustments are provided for varying point angles, clearance and chisel angles. The feed is automatic and the amount to be removed is adjustable, between ·005 in. and ·250 in., which is pre-set to a graduated scale. The speed of removal of material is controlled hydraulically and is pre-set according to drill diameter. Automatically, the initial heavy feed gradually decreases to a very light final cut. The method of locating and clamping ensures a correctly centred point and prevents any damage to the lands of the drill.

Automatic oscillation of the grinding head has adjustable length of stroke. A diamond for wheel-truing is incorporated in the guard and the setting of the machine need not be disturbed when this is used.

Further details, including price and delivery, may be obtained from The Sheffield Twist Drill & Steel Co. Ltd., Sheffield. The Midlands Technical Representative for demonstrations and sales is Mr. John Dodd, 58, Avon Crescent, Stratford-on-Avon.

Ministry of Transport Accident Report

Chinley, March 8, 1958: British Railways, London Midland Region

Colonel W. P. Reed, Inspecting Officer of Railways, Ministry of Transport & Civil Aviation, inquired into the accident which occurred at about 9.25 p.m. on March 8, 1958, at Chinley, when the 5.15 express excursion, Luton to Manchester Central, consisting of 10 coaches drawn by a Class "6" 4-6-0 engine, was wrongly admitted under clear signals to an occupied platform line and collided at about 30-35 m.p.h. with the 7.10 p.m. passenger train, Derby to Manchester Central. It had been checked at the approach to Chinley and the driver saw the other train in time to brake, but his engine penetrated the rear coach by half its length; there were, however, no passengers in that part of it. Of the six passengers in the standing and 90 in the colliding train only eight required treatment and were discharged from hospital within a few days. Severe frost had caused the down fast home signal at the South signalbox to remain irregularly at clear and the signalman had not carried out the routine duty of looking for its backlight; he did not detect the failure until too late, while the distant signal for Chinley North, below this signal, was still at clear as the signalman there had not replaced his lever. The fast lines were blocked and traffic had to be diverted over the slow lines, but there was little delay to it. Emergency services were called promptly. It was fine and clear with snow on the ground.

The accompanying diagram shows the lines, signals, etc., concerned in the case.

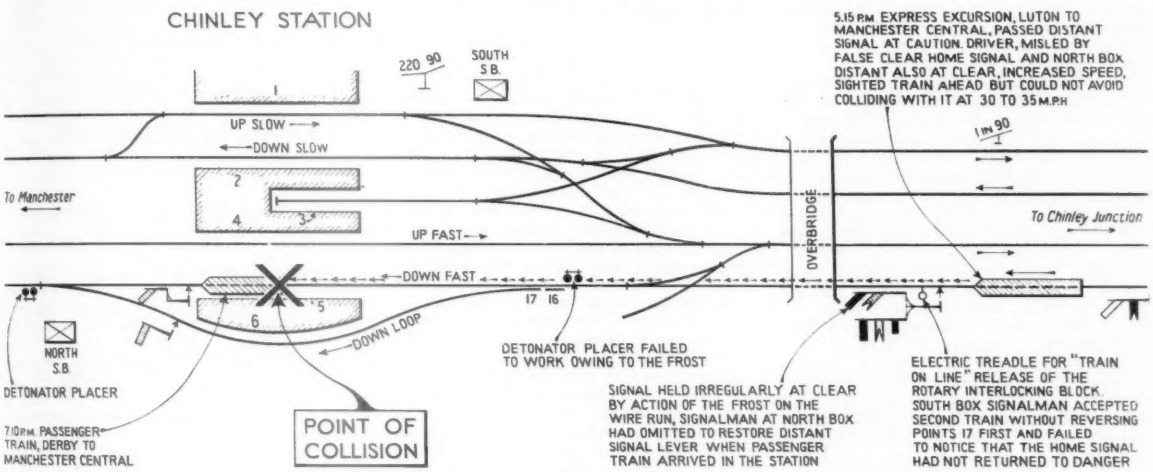

CHINLEY STATION
220 90
SOUTH S.B.
UP SLOW
DOWN SLOW
To Manchester
UP FAST
DOWN FAST
DOWN LOOP
17 16
OVERBRIDGE
1 IN 90
To Chinley Junction
NORTH S.B.
DETONATOR PLACER
7.10 P.M. PASSENGER TRAIN, DERBY TO MANCHESTER CENTRAL
POINT OF COLLISION
5.15 P.M. EXPRESS EXCURSION, LUTON TO MANCHESTER CENTRAL, PASSED DISTANT SIGNAL AT CAUTION. DRIVER, MISLED BY FALSE CLEAR HOME SIGNAL AND NORTH BOX DISTANT ALSO AT CLEAR, INCREASED SPEED, SIGHTED TRAIN AHEAD BUT COULD NOT AVOID COLLIDING WITH IT AT 30 TO 35 M.P.H.
DETONATOR PLACER FAILED TO WORK OWING TO THE FROST
SIGNAL HELD IRREGULARLY AT CLEAR BY ACTION OF THE FROST ON THE WIRE RUN, SIGNALMAN AT NORTH BOX HAD OMITTED TO RESTORE DISTANT SIGNAL LEVER WHEN PASSENGER TRAIN ARRIVED IN THE STATION
ELECTRIC TREADLE FOR "TRAIN ON LINE" RELEASE OF THE ROTARY INTERLOCKING BLOCK. SOUTH BOX SIGNALMAN ACCEPTED SECOND TRAIN WITHOUT REVERSING POINTS 17 FIRST AND FAILED TO NOTICE THAT THE HOME SIGNAL HAD NOT RETURNED TO DANGER

Diagram showing circumstances of accident at Chinley, British Railways, London Midland Region, March 8, 1958

Signalling Arrangements

The down home signals are fairly high and in good view, at about 200 yd. from the signalbox, over the overbridge where a street lamp gives sufficient light for the signalman to see the arms at night, if looking with care, while the backlights also can be seen clearly, except, of course, in fog. Track circuiting in the station locks the levers. There is ordinary three-position "pegger" block between the South and North boxes, but the lines in rear from Chinley Junction are controlled by "rotary" type interlocking block instruments with co-acting release for the cancelling of "line clear" and glass protected release plungers for cancelling "train on line." The commutators can be placed to an intermediate position known as "B.B.I." ("blocking back inside home signal") without becoming locked against a return to normal. The home levers must be normal and distant arms "on" in order to accept a train, but the home arms are not proved, as their backlights are easily visible. The usual rules apply, and with a train in No. 5 platform, as was the case on this occasion, points 17 must be reversed for the loop and that line must be unoccupied before "line clear" may be given to Chinley Junction. The soil is clay near the signalbox and the formation gives much trouble; the ballast had been cleaned thoroughly about a year previously but much clay in it had worked up above sleeper level in places. The signal wires were partly buried in dirty ballast at one or two places where they crossed the track near 17 points.

Course of Events

The driver of the standing train had had to draw forward after station work was completed to take water; he heard the following one whistling and told his fireman to jump but did not do so himself. The collision moved his engine about 50 yd. The guard, on the platform, heard the whistling and saw the express approaching but had no time to take warning action.

The express driver found Chinley South distant signal against him and brought his speed down to about 20 m.p.h., when he sighted the home, with distant for the North Box, both "off" but opened the regulator a little only on the steep gradient. He thought speed was about 30 m.p.h. when he saw the tail lamp ahead. He whistled and made a full brake application but thought it had no time to take effect. He was unable to see the lamp earlier as it was well down the platform and the line on a left-hand curve. Station structures might have obscured it.

His fireman, a passed cleaner, confirmed this, but thought the speed to have been a little higher.

Normal duty change time at the South Box would have been 10 p.m. but on Saturday afternoons signalmen are permitted to advance the time by an hour and duty was in fact changed at 9.5. The signalman on duty until then said it was very cold and towards six o'clock he experienced trouble in working the points and signals. He had to go to 17 points and ease the detector slides in order to pull off the down fast home signal and then it worked satisfactorily. He mentioned this difficulty to the man who relieved him but not another he had had with a shunt signal leading over the same points. He had failed to test the detonator placer located there as he should have done during his term of duty, especially as it was freezing. Hearing the collision after arriving home close by he returned to the box and found all block instruments showing "train on line"; the detonator lever had been pulled. He did not notice the positions of the instrument handles themselves nor whether any release plunger glasses were broken. (Those for the down lines were found broken by the lineman later.) This signalman observed the home signal arm to be then at danger but assumed it must have stuck "off" to have caused the collision; he did not discuss this with the other man.

The latter said his colleague spoke to him about trouble with his levers but had not mentioned the one working the home signal. When he himself pulled it in connection with the first train he could feel that the chain had come off the pulley under the box; he therefore restored it to normal and replaced the chain, obtained "line clear" a second time from the North Box and again pulled the lever, when he noticed that the distant for that box was now "off." The train passed and he restored the lever and observed the weight-bar repeater for his own distant, which he had not operated, to be showing "on," but did not

look at the home signal backlight.

When accepting the express at 9.19 he failed first to reverse 17 points, as the rules required, as the overlap on the fast line was still occupied, and admitted to working generally in that manner. He could not in due course move the points and then noticed the signal arm to be still "off" and realised that the detector was holding them. He explained how he took up detonators and endeavoured to speak to the North Box; finally he went out with a red hand lamp intending to put detonators down but it was too late. He had pulled the lever of the detonator placer before the train reached points 17 and it seemed to work normally. (It is, however, wire operated and, being frozen, did not in fact respond.)

This signalman had not noticed whether the release plunger glasses were intact; he had been in the box only a few minutes when the collision occurred and had had no occasion to use the plungers during the previous three weeks. He had never used the B.B.I. position of a commutator while at this box. A class 2 signalman, with 25 years service, 10 in this box, he had no explanation to offer for his improper practice of working.

The signalman at the North Box also had trouble with pulling signals off but had not sent for the lineman, saying it was usual to pull hard and if necessary free the wires to make signals work correctly; there had been no total failure of either signals or points. The first train, for which all signals were cleared, arrived at 9.19, but he did not replace his distant lever. It was his habit not to do so until replacing all down levers after a train passed, as freight trains sometimes stopped to change crews with the rear outside the distant, and he only operated a weight-bar; the signal was returned to caution when the arm above was put back to danger. He tried to excuse himself by saying that his box was closed for a part of each Sunday when all running signal levers were reversed. He said he had a telephone message from the South Box and heard the second train coming so immediately restored all signals and reversed the loop exit points, thinking that if the train ran by signals into that line it might not stop before reaching the end of it. A Class 3 signalman, he had been in North Box nine years.

A telegraph linesman arrived 2 hr. later at the South Box and noticed the broken release plunger glasses and the down fast commutator to be in the B.B.I. position; he was joined by a telegraph inspector, when thorough tests were made and all equipment found in good order.

A signal inspector tested the mechanical equipment and found the South Box detonator placer failed to operate fully until thawed; he found the place where the ice-encrusted signal wire was held in the ballast and reproduced the fault next morning. It was possible to pull the signal off but the return weights were insufficient to move the wire back. When the ballast had been cleared the signal responded properly. There was no other fault in the signalling. He had received no reports of trouble of this sort at Chinley during his four years in charge of the district.

A district signalmen's inspector, an hour after the accident, found the down fast commutator at "train on line," but did not see if any glasses were broken. He had no suspicion that the signalman was breaking the block rules, very difficult to detect unless committed while being watched.

Another such inspector, on the district for three years until his transfer four months previously, had never found the signalmen breaking any of the principal regulations, but had found some minor discrepancies and pointed them out. He had not compared block registers at Chinley; comparisons made elsewhere were done to find the reasons for train delays and not to check the recording.

The stationmaster, however, who was away from duty at the time of the accident but had been eight years at the station, had noticed irregularities on the part of these two signalmen and reported them; he knew that disciplinary action had been taken and arrangements made that the two men should not be at their respective boxes during the same shift. He had found it necessary to be very strict in the supervision of these boxes.

Inspecting Officer's Conclusions

The express driver was in no way to blame and was fully alert. The responsibility rests primarily on the South Box signalman, who failed to see that the home signal returned to danger, a duty which should be instinctive in a good signalman, and knowingly contravened the block regulations in not setting the points to obtain a clear overlap. He admitted being in the habit of doing this, but would give no reason for it. Colonel Reed concluded that he lacked a proper sense of responsibility and was unfit to be entrusted with a signalman's duties; he was informed that the man had now left the service.

The other signalman's failure to return his distant lever to normal undoubtedly contributed; had he done so promptly the express driver would have braked to stop at the signal ahead and not increased speed as he did on seeing both home and distant arms at clear. This signalman's method of working, as described by himself, was reprehensible.

Colonel Reed was satisfied that the position of the block instrument handle and condition of the protecting glasses, about which evidence was conflicting, had no influence on the wrong actions leading to the collision. Failure of the detonator placer also did not materially affect matters as the express driver saw the train ahead very soon after passing it. In this exposed locality, however, it is necessary to have the best equipment and the machine is to be replaced by a modern one operated by rod.

Remarks

The dangerous situation giving rise to the accident would not have occurred had the home signal arm been proved, besides the lever, but it is not customary to do this where a signal is easily visible and no unusual circumstances here make it specially advisable. Failure to keep the signal wires free from the rising clay also contributed; Colonel Reed has no doubt that closer attention will be given to this aspect of maintenance in future.

It is somewhat disturbing that the signalmen's irregular methods had not come to the notice of their inspectors. Both men admitted to being accustomed to such working and their shortcomings had been brought to light. The stationmaster had shown a very proper sense of duty in what must at times have been an unpleasant task of supervision over the years. It is surprising, therefore, that the two inspectors specially concerned with supervision, who might have known that these men were not altogether reliable, did not keep closer check on their work, which they could have done by comparing the registers for each box with those of adjoining ones. A comparison made at Colonel Reed's request for the week previous to the accident and the 10 p.m. to 6 a.m. shift, when the South Box signalman concerned in this case was on duty, and covering the three boxes involved, showed considerable discrepancies, mostly attributable to this man, which would have given sufficient grounds for a more rigorous examination of the working. It is more than likely that if comparisons had been made in the past a number of discrepancies would have come to light warranting corrective action.

The value of a close check of registers was mentioned in the report on the Irk Valley Junction collision of August 15, 1953 (see our issue of January 1, 1954) and again emphasised in that on the collision at Newlay & Horsforth on November 22, 1956 (see our August 16, 1957, issue, p. 198). On both occasions the British Transport Commission drew attention to it as a means of supervising the working of signalmen. No doubt inspectors are busy men and may find it difficult to make time for close checking; this work is valuable, however, as checking repeated slack working by a few careless signalmen. Colonel Reed is glad to report that instructions have been issued on the London Midland Region for a twice yearly cross check by district signalmen's inspectors or stationmasters.

English Electric Co. Ltd. in 1958

The export of electric and diesel-electric locomotives built by the English Electric Company, Limited, continued throughout the year. Electric locomotives were shipped to both Spain and South Africa. The 3,600-h.p. 3,000 V. d.c. units for the Spanish National Railways are identical to the 60 locomotives in service with that system since 1952. Manufacture of the 2,000-h.p. 3,000 V. d.c. units for the South African Railways continued; well over 100 of these locomotives have now been shipped. Diesel-electric locomotives of 2,000 h.p. and 1,500 h.p. have been supplied to Rhodesia and Malaya respectively whilst locomotive equipments have been supplied to the Rocklea Works of the English Electric Co. of Australia Pty. Ltd. for locomotives being built for the Midland Railway of Western Australia.

Orders received from overseas countries during the year included 1,840 h.p. diesel-electric locomotives for East African Railways & Harbours; an order won in the face of world-wide competition. A repeat order was received from the Victorian Railways for electric multiple-unit train equipments, and a repeat order for 750 h.p. diesel-electric locomotives for the Ghana Railways was also received.

British Railways Orders

At home, many orders were received from British Railways in connection with the modernisation plan. During the year, 400 h.p. shunting locomotive equipments were supplied in large numbers for mechanical parts built in British Railways workshops. Supply of electric train equipments continued to the Southern Region of British Railways.

Repeat orders were received for 500-h.p. diesel-electric train equipments for the Southern Region and for 30 more 2,000-h.p. locomotives for the Eastern Region. An important order placed by British Railways during 1958 was for 22 3,300-h.p. "Deltic" diesel-electric locomotives.

Pre-fabrication of Railway Signalling Installations

At a well-attended meeting of the Institution of Railway Signal Engineers held in London on November 20, 1958, with the senior Vice-President, Mr. D. G. Shipp, in the chair, a paper entitled "Pre-fabrication of Railway Signalling Installations in New Zealand" was read by Mr. W. R. Carslake on behalf of the author, Mr. W. A. Hardman, of the New Zealand Government Railways.

The paper, illustrated by slides, explained the need for a quick method of installing signalling, which led to a system of pre-fabrication of equipment. It described the planning of a job; the way in which the separate units of an installation were prepared beforehand; the loading of signalling equipment on to a special train; the positioning and unloading of the train; the installation of the equipment on site; the use of the cable plough for cable laying; and the testing of apparatus before loading, and testing on site on completion of the installation.

Importance of Management

Mr. J. H. Fraser, opening the discussion, suggested that one of the weaknesses in the path of a young signal engineer was a tendency to be over-engrossed in technicalities and not pay enough attention to engineering management and execution of the work. It would pay any young signal engineer to study thoroughly such a paper as Mr. Hardman's, as the method described was one of the ways in which the cost of signalling could be brought down. Another important thing brought out in the paper was the way in which the installation work was carried out, without interference to traffic.

Mr. Leach noticed that there was no mention in the paper of floodlighting equipment of night work, and he presumed, therefore, there was none. Were the men employed railway staff or contractors' men? He would also like to know whether there was any scheme on the N.Z.G.R. for the use of electronic equipment for C.T.C.

Need for Experienced Staff

Mr. F. W. Young was interested to note that despite different geographical conditions, the difficulties experienced in New Zealand were, basically, the same as those met with in this country today, especially as to the need for staff of the right experience being in the right place and at the right time.

Power Tools

He was also interested to learn of the full use being made of power tools. One must be sure, he pointed out, that full economic value would be obtained from such machinery, as otherwise, it would be a loss in terms of the interest which had been paid on the capital outlay.

Mr. F. L. Castle, who had recently visited New Zealand, had had an opportunity of talking with Mr. Hardman and of seeing some of the things described in the paper. He was much impressed with the enthusiasm and thoroughness with which the problems had been tackled.

Mr. B. Neill said that it appeared that the signal engineer was only able to have complete occupation of the line for a very short time. Why, in that case, was a complete train used for the equipment, instead of road transport?

After Mr. Carslake had replied to some of the points raised, Mr. W. Owen proposed a vote of thanks to Mr. Hardman for his paper and to Mr. Carslake for reading it and dealing so well with the discussion.

Hale & Hale (Tipton) Limited

Importance of modernisation

The 22nd annual general meeting of Hale & Hale (Tipton) Limited was held on December 18 at Dudley, Mr. R. C. Leppington (Vice-Chairman & Managing Director) presiding in the unavoidable absence of the Chairman, Mr. W. Edgar Hale, M.I.Mech.E.

The following is an extract from the Chairman's circulated review:

I would like to emphasise at once that the year has been a most difficult and disappointing one.

The consolidated trading profit for the year amounts to £93,689 as compared with £96,342 for the previous year. Taxation requires £22,638, and, after various adjustments, there remains a consolidated net profit of £18,884 as compared with £26,701.

The past twelve months' working has been extremely difficult, although the car industry has kept up remarkably well. Over the year there was a considerable falling off in business generally, due in large measure to the credit squeeze, bringing about stock reductions and cuts in delivery dates by customers.

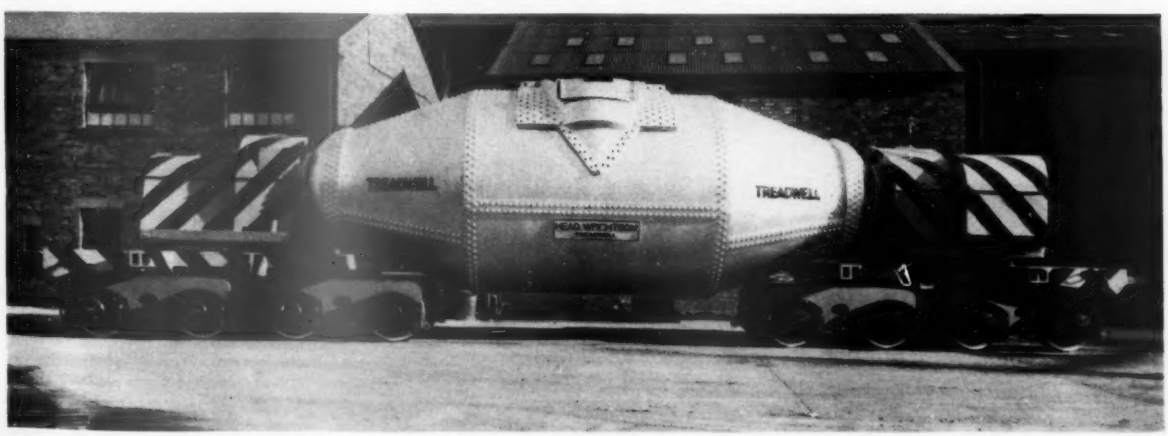
Your Board's attention is constantly directed towards research into possible improvements in our methods and equipment, and we have every reason to be satisfied with their efforts in that important direction.

A rough estimate of the percentage of our output exported would, I think, be about 60 per cent, and with a turnover such as your company enjoys, this represents a figure of no mean importance.

I think that world trade will expand generally, and particularly in the case of our own country, the future should be bright provided that our costs of production can be kept around present-day values.

The report was adopted.

High Capacity Hot Metal Mixer Car for Steelworks



One of three 180-ton capacity hot metal mixer cars for the Steel Company of Wales Limited about to be worked over British Railways from Thornaby-on-Tees to Margam, South Wales. The gross weight when fully loaded is 380 tons and the axleload 24 tons: The builders are Head Wrightson Teesdale Limited

Chairman's Message to B.T.C. Staff

Sir Brian Robertson, Chairman of the British Transport Commission, issued the following Christmas and New Year message to members of the staff throughout the Commission undertaking:—

"The best way to ensure a good Christmas for oneself is to make others happy. Please do your best, in so far as your duties permit it, to ensure that our passengers travel comfortably at this Christmas time and that their goods and parcels arrive safely and on time. And I hope that you will have a good time yourselves with your friends and family.

"1958 has not been an easy year in many ways. What about 1959? We hear a lot said these days about falling traffics for public transport, and it is true that there is a fall in some directions. But don't get discouraged. If we give the country good service, each in our several ways, we have nothing to fear as an industry. If we look after our customers, the traffics will look after themselves.

"The future of our industry is mainly in our own hands. It is no use waiting for some fairy godmother to make everything easy with a touch of her wand. But by our own efforts we can do it.

"So take heart all of you—in buses, lorries, trains, barges, ships, docks, hotels, workshops, offices, wherever you are, and a happy and prosperous New Year to you all."

Modernisation of Manchester Oxford Road Station

Work has begun on the new Oxford Road Station, Manchester, in the London Midland Region of British Railways. The work is extensive, but this will not interfere with the use of the station by Altrincham line trains. The work has been co-ordinated in close sequence into a timed programme. Passengers are not expected to be unduly inconvenienced.

The project is due for completion towards the end of 1959. The triangular layout will have its base, as now, on Oxford Road. Trains from Altrincham will use two platforms on the west side and trains from London Road will be served by three platforms on the south-east side.

Car Park

A spacious station concourse will be linked to Oxford Road by a new approach road encircling a car park on the station frontage.

All the existing station buildings are being demolished and new buildings are being provided for a waiting room and booking office. These will be erected beneath the curve of three conoid roof units. The latter will consist of three layers of timber boarding supported on glued laminated timber tied arches. The shells will be tied on one edge to the arch and on the opposite edge to the tie. The vertical space between the shells is glazed to provide a north light.

The five platforms will be connected by a new concrete footbridge and a subway with lifts will facilitate the transport of luggage. The Altrincham line trains will have a new platform. There will be new curvelinear roofed areas to shelter passengers waiting on the platforms. The awnings will be formed by cylindrical timber shells, carried on cantilevered laminated timber frames. The awnings and the main arches will be prefabricated since construction will be restricted to certain periods.

The existing platforms are to be extended to accommodate the longer trains of the main line 25 kV. a.c. electrified system and this entails some widening of the existing Oxford Road and Gloucester Street bridges, with re-modelling of the points and crossings leading into the platforms.

Reconditioning Lifts on L.T.E. Central Line

One of the original lifts at Holland Park Station on the Central Line of London Transport has been reconditioned. The lift was in use when the first section of the Central London Railway, now the Central Line, was opened in 1900. The electrical and mechanical equipment has been entirely replaced and the interior of the car has been modernised.

New landing doors, door and gate operating gear, and so on, have been fitted. As at other stations on this section, the lifts at Holland Park were of Sprague design. At most stations these have been replaced by escalators, and three more will be displaced in the Spring of 1959 when a further section of the new Notting Hill Gate station will be brought into use. The traffic at Holland Park and Lancaster Gate does not justify replacement by escalators or high-speed lifts. The lift at Holland Park (No. 1 lift) is the first to be reconditioned. Similar work is now being carried out on the second lift at this station, and both lifts at Lancaster Gate are to be dealt with in due course. Reconditioning has involved replacement of the existing winding machine by new gear manufactured by Clarke, Chapman & Co. Ltd. Electric controllers manufactured by Watford Electric & Manufacturing Co. Ltd. are being installed, and air engines for operating the doors and gates, similar to those used on Underground rolling stock, are fitted. Push button controls of the new standard L.T.E. design are fitted. Limit switches in the lift have been replaced by a form of cam-operated switchgear located in the machine room. The operation of the safety gear has been made uniform with that on other L.T.E. lifts.

The work has been carried out under the supervision of Mr. I. W. Standring, Mechanical Engineer (Lifts and Escalators), to the requirements of Mr. A. W. Manser, Chief Mechanical Engineer (Railways), London Transport.

Questions in Parliament

Cost of Army Travel Warrants

Sir Peter Agnew (Worcestershire S.—C.) asked the Secretary of State for War how much, in the last accounting year, was paid to the B.T.C. in respect of fares for officers and other ranks of the Army travelling on free warrants in the British Isles.

Mr. C. Soames, in a written answer: The cost of warrants for free travel on leave in the financial year 1957-58 was £1,306,000.

London Travel Committee

Mr. J. A. Biggs-Davison (Chigwell—Ind. C.) asked the Minister of Transport & Civil Aviation on December 3 if arrangements would be made by the London Travel Committee to obtain the advice and assistance of authorities and residents in Essex concerned with and having experience of movement to and from central London in the peak hours, in view of the fact that the Committee's terms of reference required it to seek the co-operation of other bodies concerned and of the public generally in pursuing the objects for which it was set up.

Mr. Harold Watkinson, in a written answer: I must leave it to the chairman and members of the Committee to decide how best to carry out their work, but I am sure that they will wish to make full use of the advice and assistance of bodies representing the view of the travelling public. I will bring the suggestion to the chairman's notice.

Mr. J. Biggs-Davison (Chigwell—Ind. C.) asked the Minister of Transport & Civil Aviation on December 10 whether he would now make known the address of the London Travel Committee so that other bodies and members of the public with experience of traffic congestion in London might make representations to it.

Mr. G. R. H. Nugent, Parliamentary Secretary, in a written answer: The Committee has its office in the Ministry at Berkeley Square House, W.1, and letters may be addressed to its Joint Secretary there.

Redundancy at Barnsley

Mr. Roy Mason (Barnsley—Lab.) asked the Minister of Labour on December 10 what assessment had been made of the number of railway workers who would be declared redundant as a result of reorganisation of train and traffic workings in Barnsley and district, with particular reference to the closing of Pindar Oaks and Stairfoot marshalling yards.

Mr. Iain Macleod, in a written reply: I understand that 142 railway workers will be affected, and that they will be dealt with under the existing redundancy agreements.

L.M.R. Safety Slogan Competition.—In a British Railways, London Midland Region, competition held during National Safety week, three prizes of £50, £30, and £20 in Savings Bonds were won by members of the staff of the Region. The intention of the competition was to reduce accidents. Staff were invited to place 12 safety slogans in order of merit. Nearly 8,000 railwaymen from all parts of the Region stated a preference for "Safety First—you may not have a second chance."

New Walkway at Liverpool Street Station.—The work of renewing the steelwork under the Great Eastern Hotel, near platforms 9 and 10, Liverpool Street Station, British Railways, Eastern Region, is making good progress. A further stage was reached recently, when the new walkway connecting the two platforms was completed. This means that passengers will no longer need to use the congested area under the hotel as an alternative to the footbridge. The walkway and neighbouring platform area have been decked with prestressed concrete planks with an in situ concrete topping supported on brick cross walls. This form of construction is economical and facilitates access to a group of telephone cables on platform 9. A handrailing has been attached to the edge of the walkway. The work was carried out by the District Engineer, Stratford, under the general direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region.

Contracts and Tenders

Indian Railway electrification contract for B.I.C.C.

The British Insulated Callenders' Cables Limited groups of companies has been awarded a contract by the Indian Railway Board for the design, supply, and installation of 25-kV. 50-cycle, single-phase a.c. overhead electrification equipment. The approximate value of the contract is £2,500,000 of which about 60 per cent will be spent in Indian currency on locally manufactured materials and the local staff and labour costs, while some 40 per cent will be in materials to be supplied from the United Kingdom. The lines to be equipped are near Calcutta on the main line to Bombay on the South Eastern Railway; they lie between Tatanagar and Rourkela, together with the branch from Rajkharswan to Dongaposi. The length of track to be electrified is about 420 miles and the route links the iron ore fields in Bihar with the existing steel plant at Tatangar and the new plant under construction at Rourkela.

The China National Machinery Import Corporation, Erh Li Kou Hsi Chiao, Peking, has placed two orders for machine tools to the value of £1,100,000 with British manufacturers. Asquith Machine Tool Corporation Limited will supply equipment to the value of some £600,000 including horizontal milling and boring machines. David Brown Industries Limited. Machine Tools Division, will supply turbine gear hobbing machines, gear cutting tools, and measuring instruments worth more than £500,000.

South African Railways has placed an order with Amato Textile Mills, Benoni, for 15,000 tarpaulins at a cost of £231,250.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow :—

From India:

Supply and erection of remote control equipment to control 25-kV. switchgear for sectioning of electric traction overhead equipment from two control centres at Asansol and Chakradharpur.

The issuing authority is the General Manager & Chief Engineer, Railway Electrification, Eastern Railway of India. The tender No. is PS/AC/1. The closing date is January 16, 1959. Bids should be addressed to the General Manager & Chief Engineer, 235, Lower Circular Road, Calcutta, 20. The Board of Trade reference is ESB/30430/58.

452 semaphore signal upper quadrant spectacle fittings

32 yellow light blinders for three-position upper quadrant distant signal

1,004 signal lamps "U.Q." type

256 lamp brackets for signal lamp "U.Q." type

The issuing authority is the Director-General of Supplies & Disposals. The tender No. is WP2/4446/26/C. Bids should be sent to the Director-General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is December 30, 1958. The Board of Trade reference is ESB/30716/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

Notes and News

Cheaper Conveyance of Motorcars to Continent by Air.—Silver City Airways, which operates cross-Channel air ferries for motorcars, is to cut its charges next summer, it is reported, for the ninth time in 10 years. The aim is to benefit owners of small and medium-size cars. On the busiest route, from Lydd to Le Touquet, existing cheap winter rates will continue to June 1, 1959. Thereafter, small and medium-size cars will be carried at rates cut by up to 27½ per cent compared with last summer.

Pressed Steel Co. Ltd. London Office.—The Pressed Steel Co. Ltd. recently opened a London office at 47, Victoria Street, S.W.1, for handling business in connection with its Railway Division, Linwood Factory, Paisley, Scotland. The office is in charge of Mr. Gordon Williams, London Manager. The telephone numbers are Abbey 6172 and 1986.

Last Steam Locomotive Built at Crewe Works.—The last steam locomotive to be built at Crewe Works, British Railways, London Midland Region, left the works on December 15, to take up duty. It is a Class "9" 2-10-0 freight locomotive No. 92250 and is the 7,331st steam locomotive to be built at Crewe since it was established in 1843. Work at Crewe will now be concentrated on the building of diesel-electric locomotives, and heavy repairs to existing steam locomotives. The engine was driven out of the paintshop by the Mayor of Crewe, Councillor T. Consterdine, a former railway employee.

Rosslynlee Hospital Halt Opened.—A halt at Rosslynlee Hospital, on the Edinburgh-Peebles line, British Railways, Scottish Region, was opened by Major W. H. Callander, Deputy Lieutenant of the County of Midlothian, and Convener of Rosslynlee Hospital Committee, on December 10, 1958. The halt, which was brought into use on December 11, is adjacent to the hospital and provides a convenient means of travel to and from Edinburgh, Peebles, Galashiels and other border towns for visitors and staff.

Accommodation for Permanent Way Staff at Beighton, Eastern Region.—Work has begun on a new building to provide messroom, locker room, lavatory and washing facilities for the staff of the Permanent Way Depot at Beighton, between Sheffield and Chesterfield, Eastern Region. The building will be prefabricated and of timber construction. As it is situated in a subsidence area, special foundations have been designed and are being constructed by the District Engineer, Shef-

The last steam locomotive, a Class "9" 2-10-0 goods, to be built at Crewe Works

field. The contract for the superstructure has been placed with Dixons (Doncaster) Limited. The work is under the general direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region.

Goods Wagons Fall in Canal.—Two goods wagons were derailed and fell into an adjacent canal during shunting operations at Hempstead, Gloucestershire, British Railways, Western Region, on December 15. Three other wagons were derailed and cut into the canal bank. Canal traffic was delayed while a floating crane and drivers were brought from Sharpness to recover the wagons.

Motorman Found Not Guilty of Wilful Neglect.—Driver P. W. Hurst, the motorman of the electric train from Gravesend to Charing Cross which collided with a steam train at Maze Hill, British Railways, Southern Region, on July 4, was found not guilty, at the Old Bailey last week, of endangering the safety of his passengers by neglecting to conform to signals on the track, and was discharged.

Scottish Region Best Kept Station Competition.—In the annual best kept station competition for cleanliness and tidiness at stations in the Scottish Region of British Railways the winners of special class awards of £6 each for 1958 were Bishopbriggs, Dunragit, Lentran, Lundin Links, Park, Riddings Junction, Stirling, and Wemyss Bay. This is the seventh successive year in which Stirling has won a special class prize in this competition. First class awards of £5 each have been made to 48 stations, second class awards of £4 to 76, and third class awards of £3 to 176 stations.

B.T.C. Chairman Visits East Anglia.—Sir Brian Robertson, Chairman of the British Transport Commission, recently visited Norwich, Lowestoft, and Yarmouth. Editorial reference to his speech to the Great Yarmouth Chamber of Commerce was made in our December 12 issue. The accompanying illustration shows him with Mr. H. C. Johnson, General Manager, British Railways, Eastern Region, and other officers of the Region at Yarmouth Vauxhall Station, where it is planned to improve facilities, including new signalling, new carriage sidings, lengthening of platforms, and passenger amenities: (left to right) Mr. H. C. Johnson; Mr. A. K. Terris, Chief Civil Engineer, Eastern Region; Mr. G. G. Goodings, Traffic Manager, Norwich; Sir Brian Robertson; Mr. N. Timm, Stationmaster; and Mr. W. G. Thorpe, Line Traffic Manager, Great Eastern.

Sir Brian Robertson with officers of British Railways, Eastern Region, at Yarmouth Vauxhall Station

United Steel Companies Limited Strip Mill in Operation.—The new £4,750,000 Brinsworth medium-wide continuous strip mill at Steel Peech & Tozer Limited, Rotherham, is now fully run in. The mill rolls mild carbon and special steels up to 18-in. wide for the vehicle, domestic appliance, and other industries, and bridges a gap between the narrow and wide strip mills in the country.

Railway Benevolent Institution.—At a meeting on December 15 the Board of the Railway Benevolent Institution granted annuities to six widows and four members involving an additional liability of £232 a year; 123 gratuities were also granted amounting to £1,194 to meet cases of immediate necesssity. Grants made from the Casuaity Fund during the month of November amounted to £1,116.

H. W. Kearns & Co. Ltd. Results.—The trading profit of H. W. Kearns & Co. Ltd., machine tool makers, for the year ended September 30, 1958, was £277,752 compared with £252,676 for the previous year. After providing for taxation and depreciation, the net profit for the year was £125,610. A final dividend of 15 per cent is recommended, which, with the interim of 5 per cent, makes 20 per cent for the year.

Connecting Northern Rhodesia and the Belgian Congo.—In our issue of September 19, it was stated on page 321 that a joint committee appointed by the Governments of the Federation of Rhodesia & Nyasaland and of Northern Rhodesia had recommended to Rhodesia Railway the building of a line connecting Northern Rhodesia with the Belgian Congo. We are now informed that in terms of a Federal parliamentary resolution on West Coast routes the Federal Ministry of Transport & Works and the Rhodesia Railways are investigating the whole question of additional links to the West Coast, and other possibilities will be examined including the various proposals for linking the Copperbelt with the Congo and Angola. The merits of all the suggestions are being considered but at present a number of railway staff available for planning are committed to make special investigations on the proposals to take over the operation of the line South of Bulawayo, referred to in our October 24 issue.

Sturtevant Engineering Co. Ltd. Cathodic Protection Department.—Sturtevant Engineering Co. Ltd. has established within its central organisation a cathodic protection department. Cathodic protection is an electrical means of safeguarding ships' hulls, metal piling, buried pipework, and so on, against corrosion.

Steel Company of Wales Limited Trading Surplus.—The trading surplus of the Steel Company of Wales Limited expanded by £3,200,000 to £22,180,000 in the year ended September 27, 1958. The net profit was £5,540,000 compared with £4,660,000 in the previous year. A final dividend of 3 per cent is recommended making an unchanged total of 6 per cent for 1957-58, but in addition there is a special interim declaration of 3 per cent for the current financial year.

Sir Brian Robertson's Visit to English Steel Castings Corporation Limited.—It was reported in our issue of November 28 that Sir Brian Robertson, Chairman of the British Transport Commission, during a visit to the Sheffield works of the English Steel Castings Corporation Limited, was shown an automatic coupler designed by the company for goods wagons, and saw a demonstration of coupling. We are informed that the demonstration took place on British Railways sidings, and not within the works.

Ticket Printing and Issuing Machines at St. Enoch Station.—British Railways, Scottish Region's first installation of electrically-operated Multiprinter ticket printing and issuing machines was introduced at St. Enoch Station, Glasgow, on December 15, replacing the manual issue of tickets from racks. The machine prints all the details on the ticket in a few seconds. Five of these machines have been installed at the main ticket office at St. Enoch, each capable of issuing 1,260 different categories of ticket.

More Car-Sleeper Trains from the N.E. Region Next Summer.—British Railways, North Eastern Region, is to run 73 car-sleeper trains next year, 27 more than in 1958. The West Country service will be from Newcastle to Exeter, calling at Sheffield, every Saturday, May 16 to September 26. The Continental service from Newcastle and York to Dover and Boulogne will be running every Wednesday from June 3 to September 23 and on Mondays from July 13 to August 24. The service to the Highlands will be from York and Newcastle to Inverness on May 15, every Friday, May 29 to September 25, and on Sundays, July 26 to September 27.

The overnight train journeys on both outward and return trips save two average days' motoring. The cost of conveying the car, driver, and passengers compares favourably with road travel cost, plus meals en route and hotel charges.

Direct Telephone to Speed Rate Quotation.—Direct communication by a new telephone switchboard between the headquarters of British Railways, London Midland Region, at Euston, and freight rates sections at the principal centres in the Region has been arranged. One object is to reduce the time necessary for obtaining quotations of goods rates from headquarters.

Increase in Road Traffic Accidents.—The Ministry of Transport & Civil Aviation reports that road casualties were 13 per cent higher last October than in October, 1957; 26,721 people were killed or injured. The amount of main road traffic increased by 12 per cent, with about 500,000 more vehicles in use.

Acquisition by Turner & Newall Limited Subsidiary of Rhodesian Asbestos Limited.—The directors of Turner & Newall Limited have announced that negotiations have been completed for the acquisition by the Rhodesian mining subsidiary, Rhodesian & General Asbestos Corporation (Pvt.) Limited, of the entire issued share capital of Rhodesian Asbestos Limited, a company which is incorporated in Canada but carries on the business of asbestos mining in Southern Rhodesia on a group of properties known as the Temeraire Mine. The consideration for the purchase is £1,640,000 payable in cash.

Associated British Engineering Dividend Policy.—After reviewing the trading position for the first half of the current financial year, which is slightly more favourable than that in the latter half of 1957-58, the board of Associated British Engineering Limited has decided not to declare an interim ordinary dividend. The full year's trading results are awaited before announcement of the dividend policy. Losses have continued in the automotive and industrial division. There has been some improvement in trading results in the last few months, but improvement in the results of the division is expected to take some time.

Cleanliness and Tidiness Prizes for Railway Stations.—The "Clean and Tidy Stations" competition in the North Eastern Region of British Railways has, again, been divided into two sections. One comprises the nine large stations in the Region: Newcastle, Darlington, York, Leeds City, Leeds Central, Hull Paragon, Bradford Exchange, Bradford Forster Square, and Sunderland, and in this section Hull Paragon has, for the second year in succession, been awarded the first class prize. A trophy, for annual competition, has also been won by Hull. Newcastle Central has been awarded the second class prize and Sunderland the third class prize. In the other section, 13 stations have been awarded first class prizes. Of the remainder, 40 stations gained second class awards, and 132 stations third class awards. A further 102 stations received certificates of commendation.

Stewarts and Lloyds Limited Dividend Maintained.—The dividend of Stewarts and Lloyds Limited for the year ended September 27, 1958, is maintained at 11 per cent with an unchanged final payment of 8 per cent. The group trading profit declined from £18,251,000 to £14,265,000, and the net profit available for appropriation by the parent company is down from £6,072,000 to £5,306,000. Sales to customers amounted to £122,975,000, compared with £129,434,000 in the previous year. Besides the falling off in the home trade which was reported last year, there has now been a substantial reduction in demand for casing, tubing, and line pipe for the oil industry affecting not only Stewarts and Lloyds Limited but also American and Continental producers. While home trade prospects are more encouraging due to the stimulus now being given by the Government, there are no firm indications of any early revival in demand in the oil industry.

London Commercial Service Christmas Party.—Mr. H. A. Yates, and members of the London Commercial Service, British Railways, held their Christmas party at the National Provincial Bank Buildings, London, E.C.1, on December 18. This informal function was well attended by some 350 guests, representing a wide range of suppliers and manufacturers who have, during the course of the year, made use of British Railways goods services.

Foxhounds Killed on Electrified Main Line.—Twelve hounds of the Southdown Hunt in full cry rolled down a steep bank on to the electrified London-Brighton line of British Railways, Southern Region, last week. A train killed three and another two were killed by the live rail. Others, injured, ran yelping towards Clayton Tunnel. They were heard by men working on the line, one of whom reported by telephone, and the current was switched off. Some delay to trains ensued. There is a chain-link fence at the top of the cutting and it is not known how the hounds penetrated this.

North Central Wagon & Finance Co. Ltd.—Because the North Central Wagon & Finance Co. Ltd. is now a subsidiary of the National Provincial Bank, and to enable the company's accounts to be available for consolidation with those of the bank, the end of the company's financial year has been changed from December 31 to September 30. Profits for the nine months to September 30 were £1,876,325 (against £1,982,007 for the whole of 1957). Net profits were £493,207 for the period (£536,572 for the year) to which was added exceptional credits of £21,455 (£25,772). No ordinary dividend is being paid. Last year the total dividend was 7½ per cent.

Jonas Woodhead & Sons Ltd. Results.—No final ordinary dividend is being paid by Jonas Woodhead & Sons Ltd. for the year ended September 30. The interim dividend of 5 per cent already paid is the total for the year (15 per cent). The board has declared a special interim of 10 per cent for 1959, payable on February 27. Group net profits fell to £68,460 from £100,358. The drop in profits is attributed partly to cancellations and lack of orders on the railway side of the business, partly to reduction of schedules on the heavy commercial vehicle side, and partly to increased costs which could not be recouped in selling prices to the motor industry.

L.T.E. Campaign to Popularise Cheap Evening Underground Travel.—London Transport last week launched an advertising drive to popularise cheap evening travel on the Underground. A leading feature of the campaign is London Transport's first use of television for advertising. A 1-min. advertisement was shown on Independent Television on December 16, and will be repeated at intervals over several weeks. The object is to urge Londoners to take advantage of Underground cheap evening return tickets which are at present being bought by two million passengers a year. London Transport hopes to increase its sale still further by the campaign as part of a general effort to encourage off-peak travel wherever there are vacant seats on Underground trains and buses.

David Brown Corporation Limited Results.—The group net profits of the David Brown Corporation Limited for the year ended June 30, 1958, were £234,334, compared with £177,750 for 1956-57. As in previous years there is no ordinary dividend recommendation, and after providing £47,438 for the preference dividend the amount carried forward is £1,874,114.

North Eastern Region, Christmas Train Services.—During the Christmas period, December 22-28, British Railways, North Eastern Region, arranged to run 289 relief trains. Restaurant car facilities were provided in 39 of these, with cafeteria and light refreshment facilities in some of the others. Reservation of seats was possible in 112 of the relief trains originating within the Region.

A.C.V. Profit Reduced.—The net profit of Associated Commercial Vehicles Limited last year was £163,005, against £430,618 for the previous year. The final dividend is 2½ per cent (12½ per cent), making 10 per cent for the year (22½ per cent). A special interim dividend of 5 per cent is being paid for the current year.

Murex Limited Dividend.—The interim ordinary dividend of Murex Limited is being reduced by 2½ per cent to 5 per cent for the year ending April 30. The board states that present indications are that group results for the year will be below those of last year. The sharp decline in overall demand for the metallurgical products of the parent, experienced in the latter part of last year, has continued during the past six months because of the further recession in the ferrous and non-ferrous industries. Trading results for the half year to October 31 last, therefore, were substantially below those of the same period of 1957. Few signs of any marked improvement are reported in the demand for the company's principal products and competition continues to be severe.

B.I.M.-Polytechnic Executive Programme.—The Department of Management Studies of The Polytechnic, Regent Street, London, has reported that during 1958 there was a welcome trend in the applications for places on their four-week residential executive programme. An increasing number of medium and smaller sized firms are becoming interested in this form of management development. Although the majority of firms sending executives to the courses are large, the requests for places from smaller businesses steadily grow. To meet the demand, the department will run three programmes each year. In 1959 they start on February 2, April 13, and November 9. Applications are now being received. In addition to the Polytechnic staff, a visiting faculty of 20 senior managers and

specialists take individual periods on specific aspects of practical management problems.

Forthcoming Meetings

December 29 (*Mon.*) and December 30 (*Tue.*).—The Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 3 p.m. Christmas lectures for boys and girls.

January 1 (*Thu.*).—Model Railway Club, at the Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "Small electric motors and flexible drives," by Mr. A. H. Paling and Mr. D. Murdoch.

January 3 (*Sat.*).—Stephenson Locomotive Society, North Western area, at the Y.M.C.A., Fargate, Sheffield, at 6.30 p.m. Paper on "Some Great Eastern locomotives," by Mr. W. O. Skeat.

January 3 (*Sat.*).—Stephenson Locomotive Society, Scottish area, at 303, Buchanan Street, Glasgow ,at 2.30 p.m. Film show and display of slides, by Mr. J. M. D. Warren.

January 5 (*Mon.*).—Institute of Transport, Darlington Group, at United House, Grange Road, Darlington, at 7 p.m. Paper on "Trains—headways and margins," by Mr. E. McClelland.

January 5 (*Mon.*).—Institute of Transport Metropolitan Section, at 80, Portland Place, London, W.1, at 5.30 for 6 p.m. Paper on "Work study and transport," by Mr. D. McKenna.

January 6 (*Tue.*).—Institute of Transport, Gloucester & Cheltenham Group, at the Midland & Royal Hotel, Gloucester, at 7 p.m. Paper on "Some freight handling problems," by Mr. M. G. Cooper, District Commercial Manager (Gloucester), British Railways, Western Region.

January 6 (*Tue.*).—South Wales & Monmouthshire Railways & Docks Lecture & Debating Society, Newport Section, in the Dining Room, Newport High Street Station, at 6.45 p.m. Paper on "The commercial challenge to the railways," by Mr. S. C. Harvey, Assistant (Commercial), Western Region, Paddington.

January 6 (*Tue.*).—Railway Correspondence & Travel Society, at the Livesey Clegg House, Union Street, Sheffield, at 7.30 p.m. Paper on "York Railway Museum and its contents," by Mr. R. H. Harrison.

January 7 (*Wed.*).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Toft Green, York, at 5.30 p.m. Paper on "Developments in telecommunications with respect to the modernisation programme," by Mr. A. P. Wilson.

January 8 (*Thu.*).—British Railways, Western Region, London Lecture & Debating Society, in the Headquarters Staff Dining Room, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Paper on "Modernisation and its effect on railway operation," illustrated, by Mr. G. E. R. Penney.

January 8 (*Thu.*).—British Railways, London Midland Region, Lecture & Debating Society, in the Clerical Staff Dining Club, Cardington Street, Euston, N.W.1, at 5.45 p.m. Paper on "The customer from the railways' point of view," by Mr. E. W. Arkle, Director of Traffic Services.

January 9 (*Fri.*).—The Railway Club, at 320, High Holborn, London, W.C.1, at 7 p.m. Presidential address by Mr. T. S. Lascelles, "Safety measures on railways."

January 9 (*Fri.*).—Railway Correspondence & Travel Society, Scottish Branch, at 25, Charlotte Square, Edinburgh, at 7.30 p.m. Paper on "Some notes on the Drummond period of Caledonian locomotive history," by Mr. A. G. S. Patterson.

January 10 (*Sat.*).—Permanent Way Institution, East Anglia Section, at Norwich, at 2.15 p.m. General discussion "Relaying," with an introduction by Messrs. P. V. Williamson, H. S. Bullard, G. W. Baker and G. E. Bayfield.

January 10 (*Sat.*).—Railway Correspondence & Travel Society, Sussex & Kent Branch, at the Regent Restaurant, Brighton. Second annual dinner.

January 10 (*Sat.*).—Railway Correspondence & Travel Society, South of England Branch, at the Y.M.C.A., Friar Street, Reading, at 6 p.m. Illustrated paper on "Locomotives of the S.E.R.," by Mr. D. Bradley.

Railway Stock Market

Stock markets continued to give a firm display before the Christmas holiday, and many shares are finishing the year at or near highest levels touched in the past 12 months. It is surprising there has not been considerable profit-taking bearing in mind the substantial gains recorded this year, but the absence of selling reflects the mood of optimism prevailing about the outlook for 1959, which, it is being assumed, will bring a strong revival in world trade. Shares of locomotive builders and engineers participated in the upward trend and were generally somewhat higher than a week ago, the general belief being that dividends for 1958 will be maintained, and that there will be prospects of higher dividends in the future owing to the railway modernisation programme. It seems only reasonable to assume that if stock markets maintain an upward trend next year, shares of locomotive builders and engineers should participate.

Canadian Pacifics have shown their usual activity and moved fairly closely with Wall Street. At $53 at the time of writing, they were slightly lower on balance, comparing with $53¼ a week ago; highest and lowest levels in the past twelve months were $56½ and $42¼ respectively. White Pass shares, $14 at the time of writing, have had extreme levels in the past year of $15½ and $12½. Antofagasta encountered fresh selling, and receded further to 12¼, compared with the year's extremes of 19 and 10, while the 5 per cent. preference at 27 were the same as a week ago. There has been some switching from the ordinary into the preference stock, which it is pointed out, might have the scope for the bigger capital appreciation when the railway's earnings improve in the future. It is true that the preference stock is out of the dividend list at present, but the dividend is cumulative. When the stock was in the dividend list it was up to 37¼ earlier in the year.

In other directions, United of Havana second income stock at 6½ was the same as a week ago. In this case the year's highest and lowest have been 7½ and 5½. San Paulo Railway 3s. units remained at 2s., the year's lowest; the best for the year was 2s. 4½d. Elsewhere, Mexican Central "A" bearer debentures at 73½ were within half a point of the year's best; the year's lowest was 65. Costa Rica ordinary stock was 14½; the year's highest was 18½. Chilean Northern 5 per cent first debentures, 50½ at the time of writing, are at the year's best; their lowest was 34. International of Central America at $23½ were around the year's best; the year's lowest was $15. Brazil Railway bonds have had extremes for the year of 6½ and 4½ and are at the year's best at the time of writing.

Nyasaland Railways shares, year's extremes 13s. 3d. and 9s. 4½d. are now firm at 13s. 3d., having held their recent rise because of the good yield and hopes that the dividend may be raised from 6 per cent to 7 per cent.

West of India Portuguese capital stock was 77, compared with the year's high and low of 78 and 63.

In other directions, Midland Railway of Western Australia ordinary stock, at 5½ at the time of writing, had extremes for the year of 7¾ and 5.

The shares of locomotive builders and engineers continued the better tendency in evidence a week ago and Beyer Peacock 5s. shares strengthened to 8s. 9d. which compares with highest and lowest of 9s. and 6s. 4½d. in the past 12 months. Charles Roberts 5s. shares (year's extremes 10s. 6d. and 7s. 3d.) were 10s. 3d. at the time of writing, while Westinghouse Brake, now 43s. 3d., had extremes in the year of 43s. 6d. and 32s. 6d. Wagon Repairs 5s. shares (now 10s. 6d.) had extremes in the year of 12s. 4½d. and 10s. 1½d. Gloucester Wagon 10s. shares (extremes 19s. 4½d. and 12s. 10½d.) are now 19s. 3d. G. D. Peters at 28s. 1½d. are at the year's best.

Current prices and year's extremes of a number of other active shares are as follows. Dowty Group 10s. shares, now 46s., are at their best for the year; the year's lowest was 29s. 3d. Pressed Steel 5s. shares 22s. 6d. (23s. 9d. and 12s. 4½d.). Associated Electrical 58s. 3d. (58s. 3d. and 47s.), English Electric 60s. (60s. 3d. and 44s. 6d.) and General Electric 39s. 3d. (40s. 3d. and 29s. 9d.).

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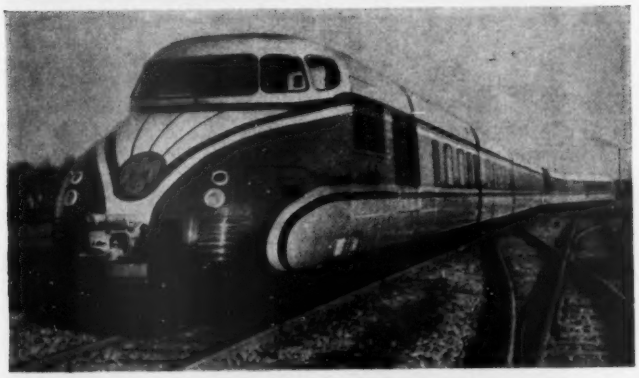

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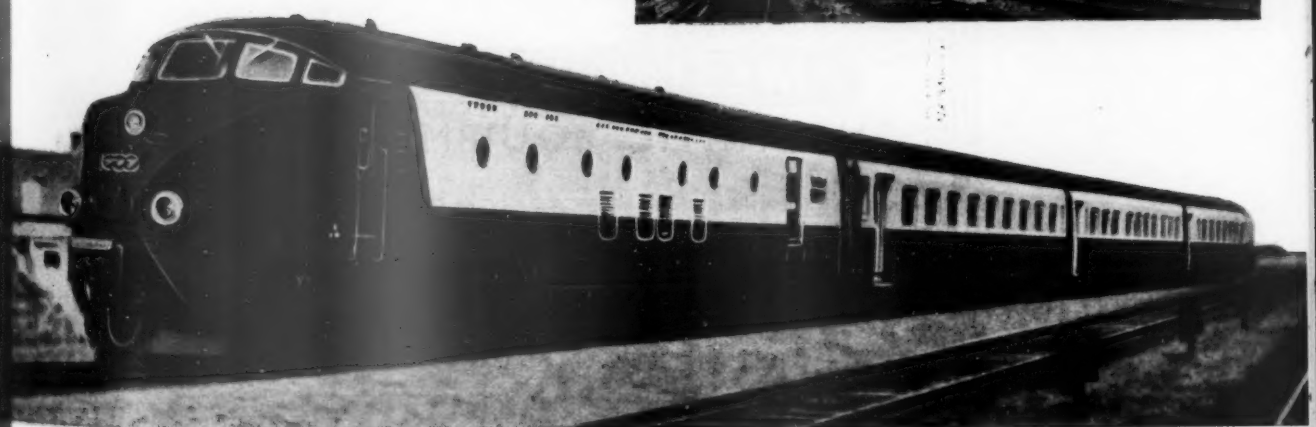

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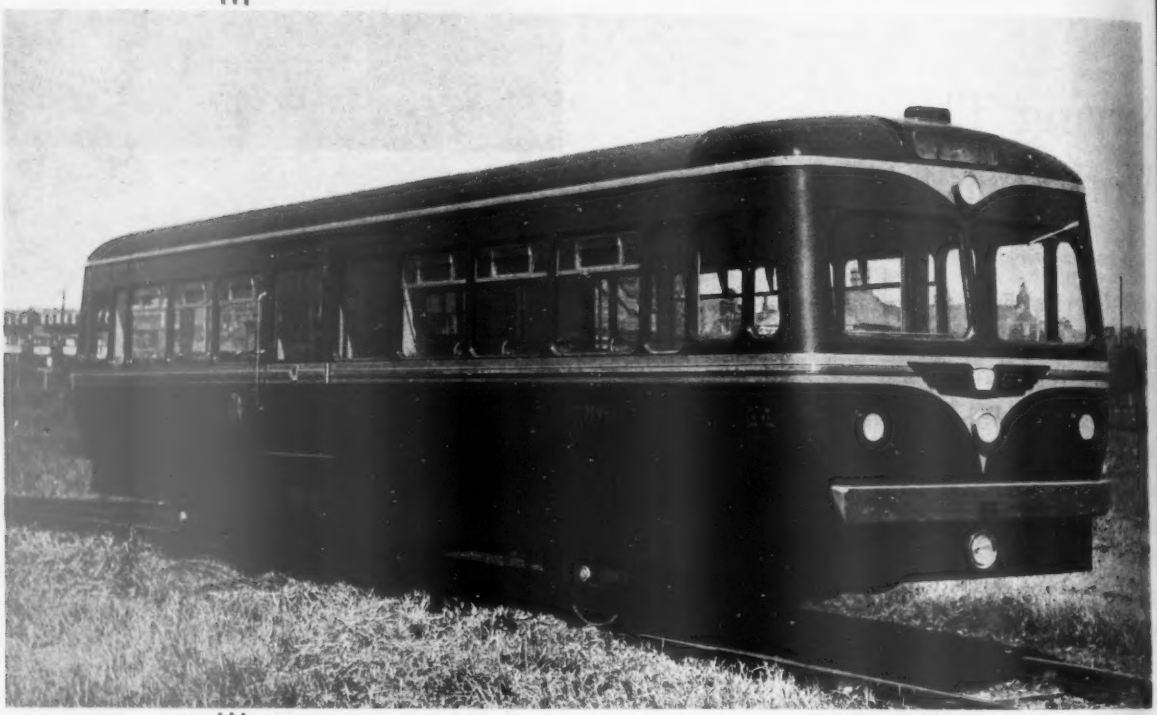

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One of two diesel railbuses built by Bristol Commercial Vehicles in conjunction with Eastern Coach Works Ltd., recently delivered to British Railways.
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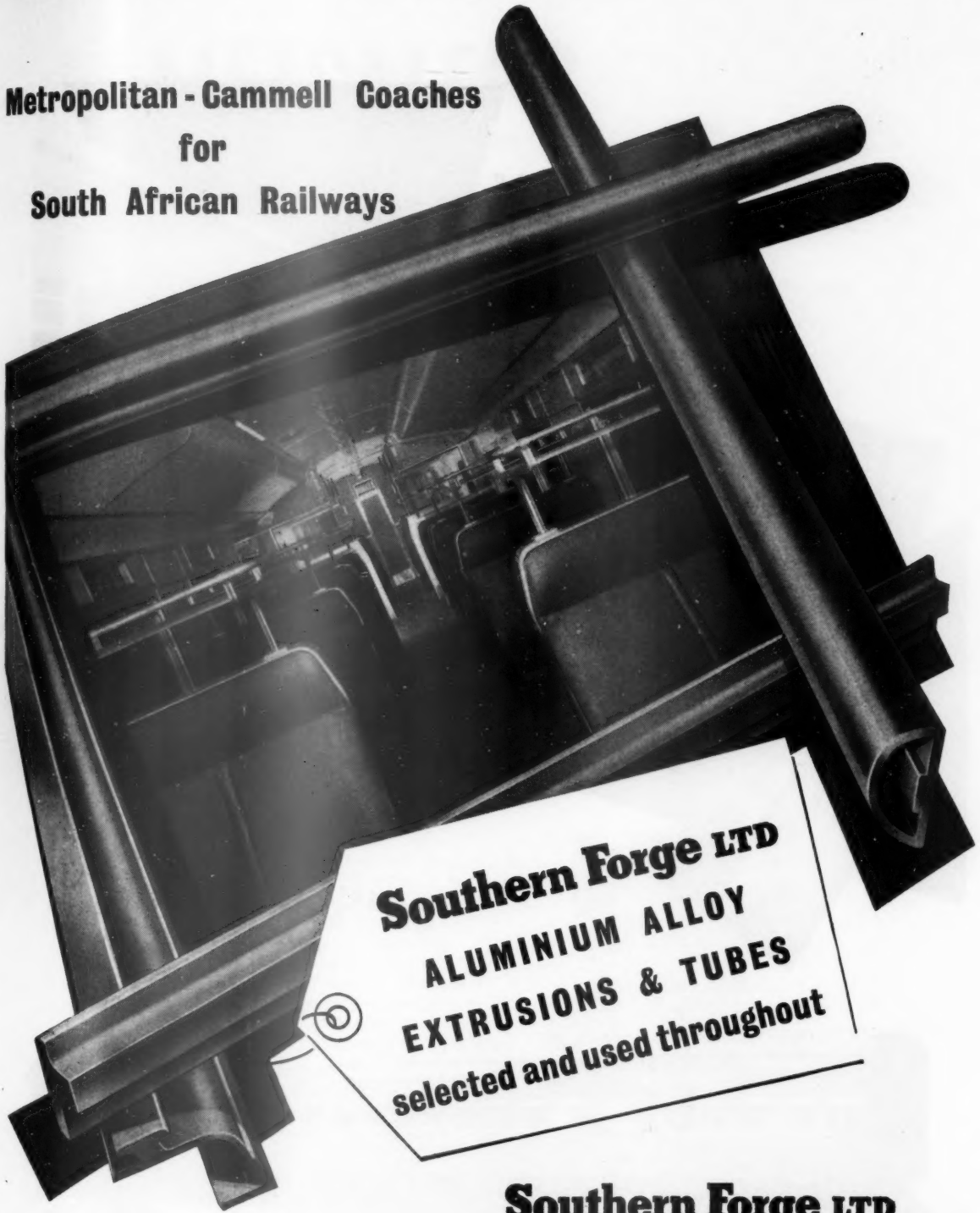

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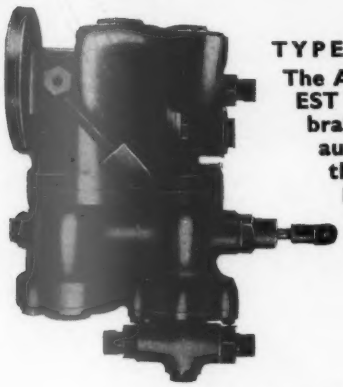

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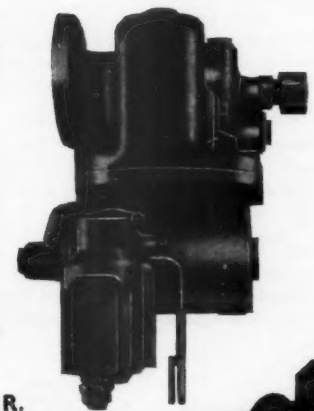

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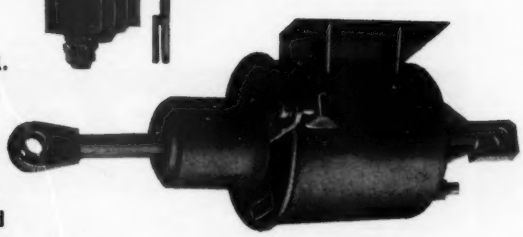

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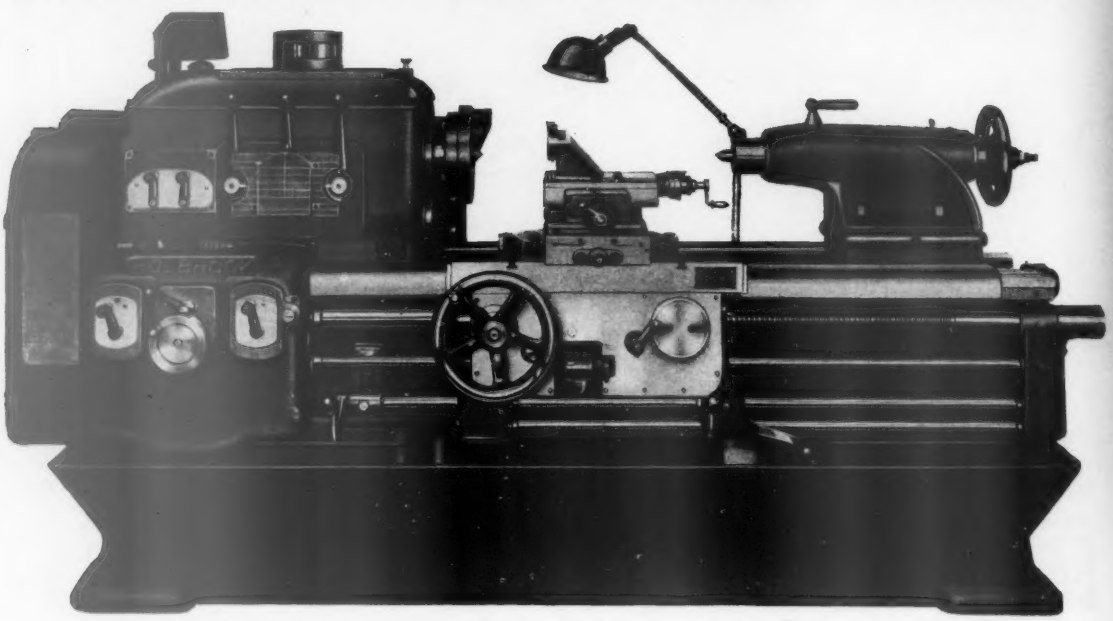

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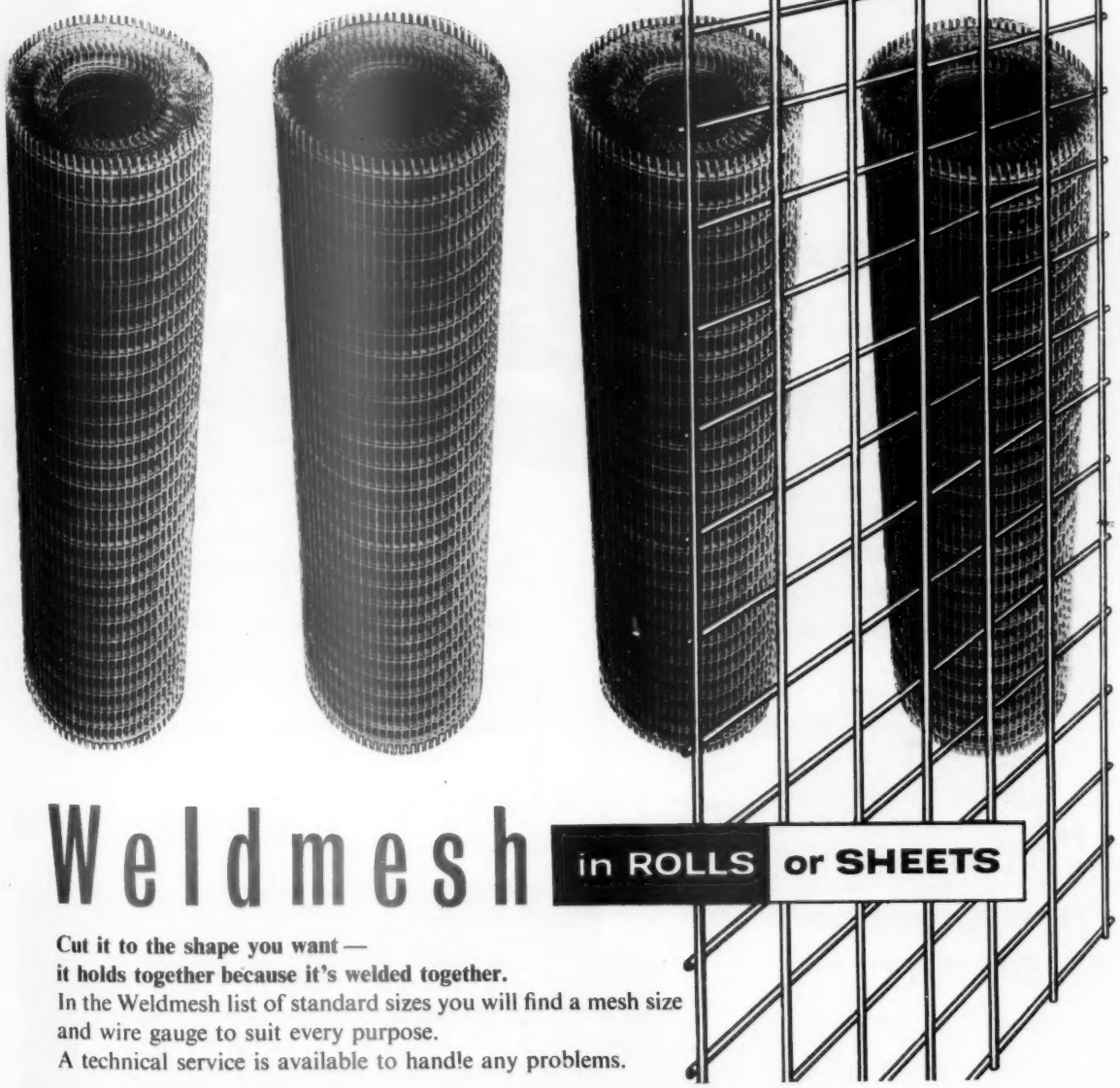

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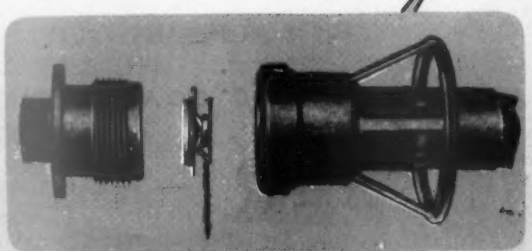

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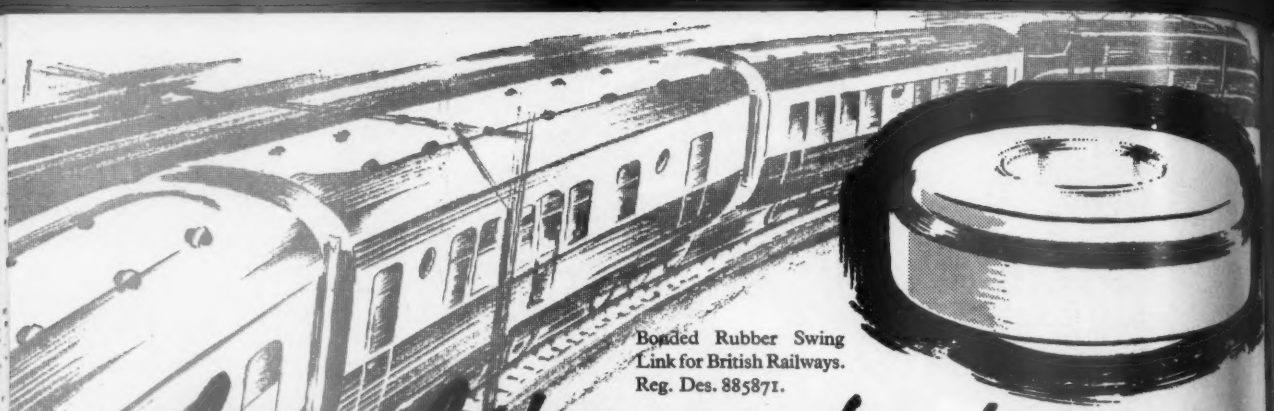

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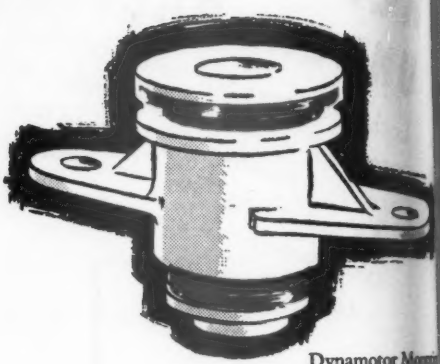

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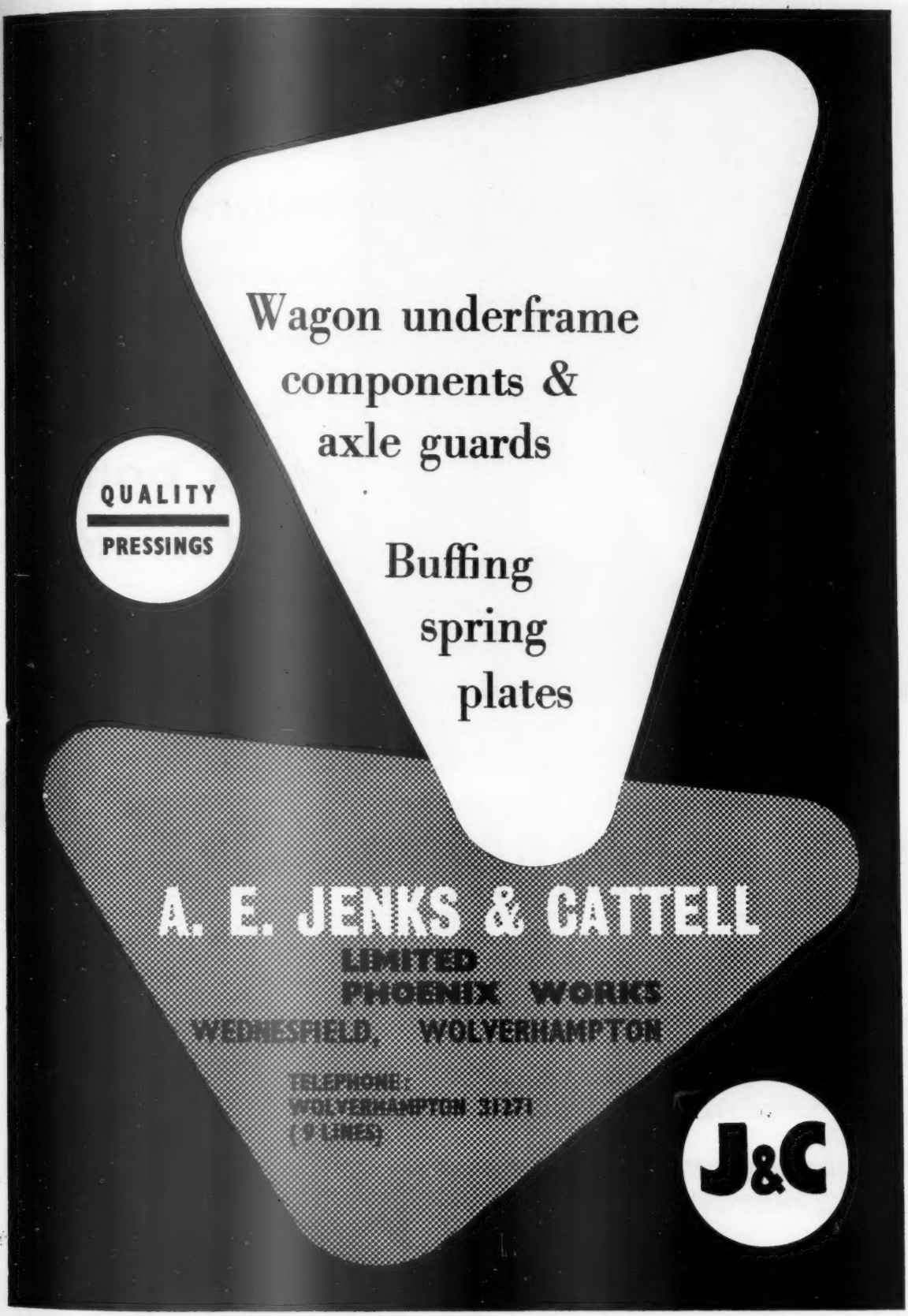
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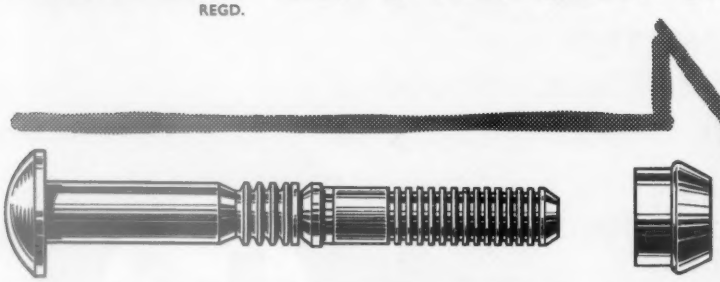

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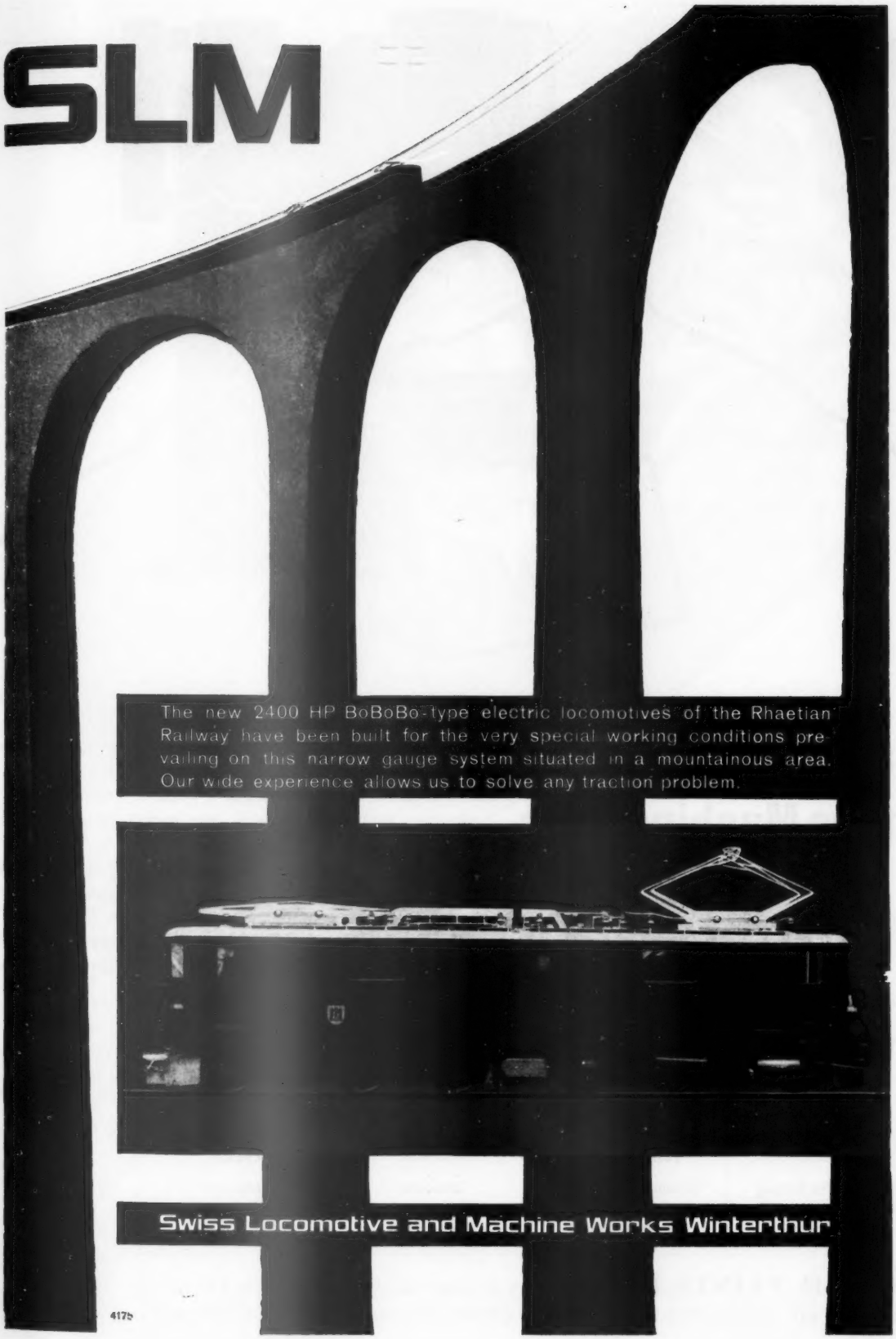

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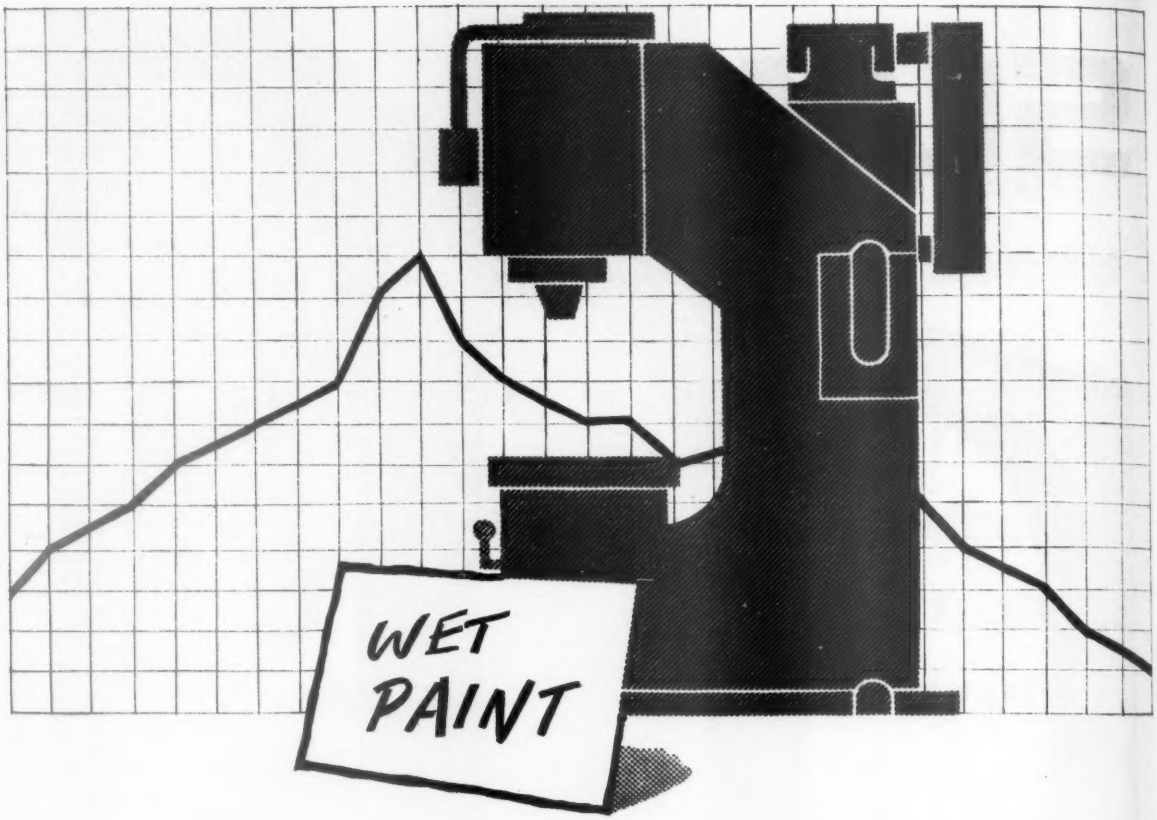

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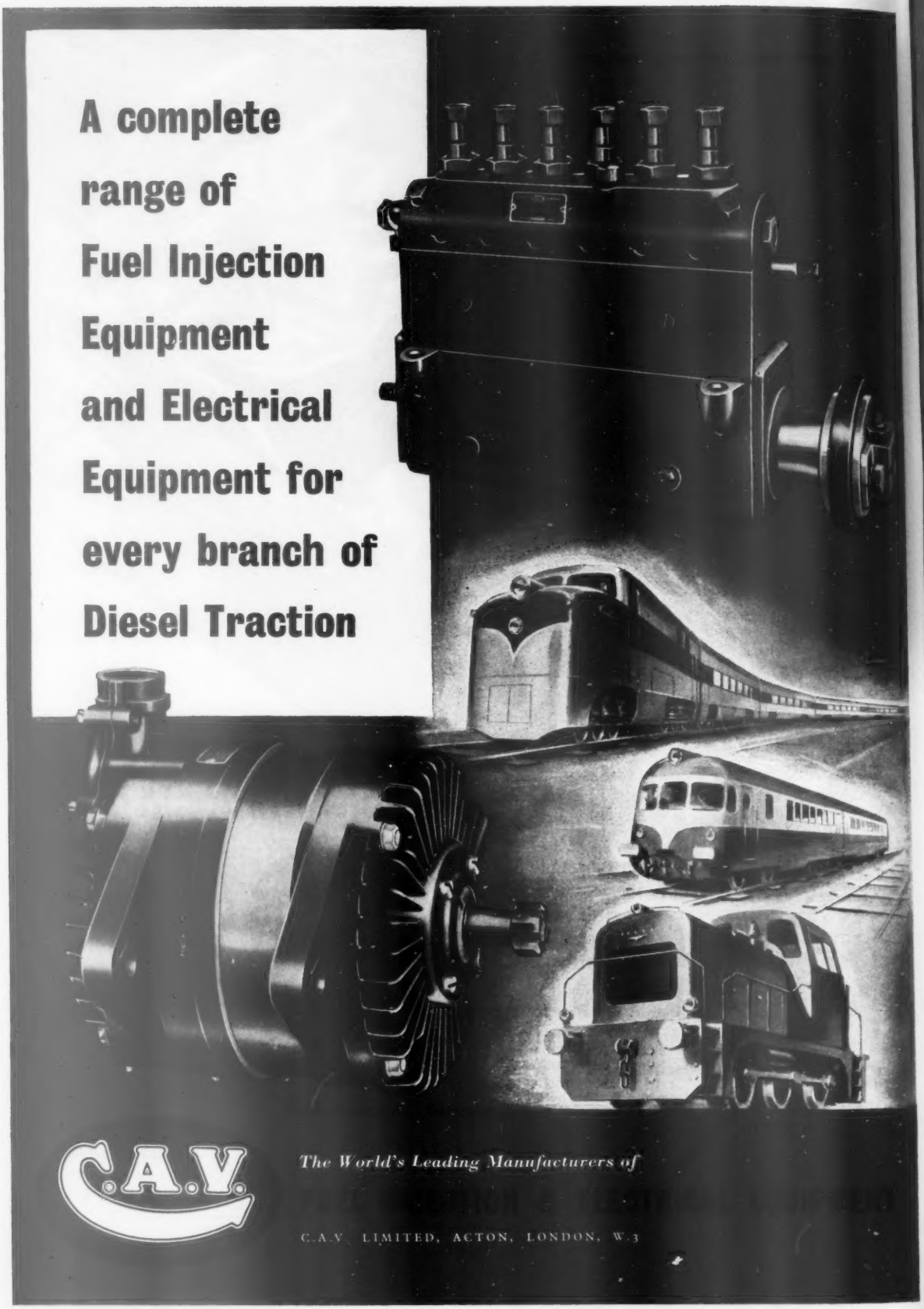
The Season's Greetings

TO ALL WHO CARE FOR
THE PERMANENT WAY

THE P. & M. CO. (ENGLAND) LTD · LONDON · ENGLAND


A complete range of Fuel Injection Equipment and Electrical Equipment for every branch of Diesel Traction
C.A.V.
The World's Leading Manufacturers of
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AP922

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Windows for the World

The organisation behind the name offers unrivalled experience in the design and manufacture of windows and ancillary equipment to suit every need.

RAWLINGS MANUFACTURING COMPANY LTD.

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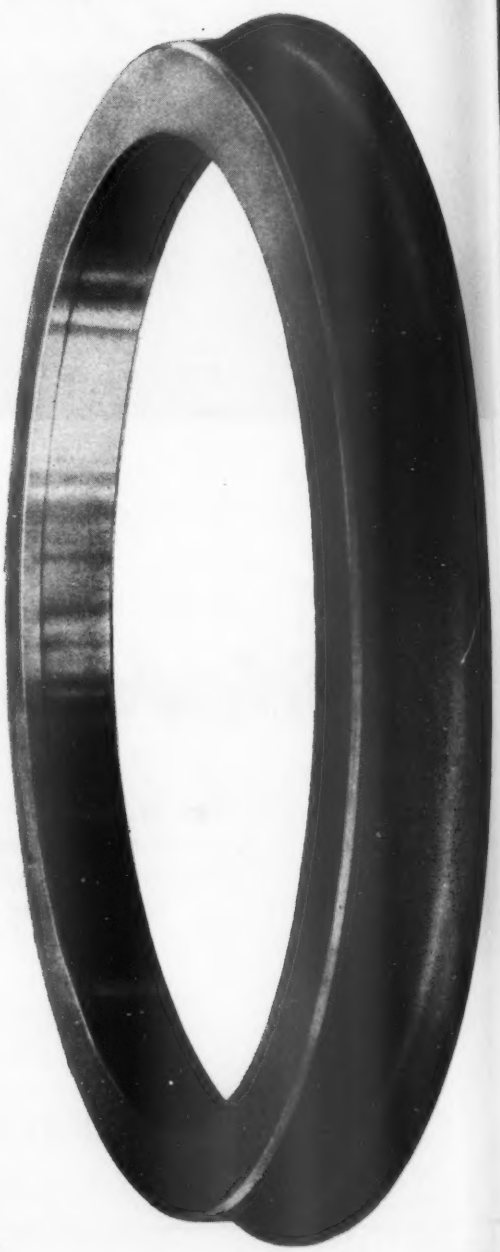
A Branch of United Steel Companies Limited

THE ICKLES, ROTHERHAM, YORKSHIRE

TYRES, WHEELS, AXLES, SPRINGS, FORGINGS



The use of tyres on electric and diesel locomotives and in passenger stock will still continue, in accordance with British Railways' plans. Steel, Peech & Tozer are one of the principal suppliers of these tyres, which they have been manufacturing for nearly 70 years. More arduous modern operating conditions call for tyres made from special quality steels: Steel, Peech and Tozer are supplying these in increasing quantities.

THE UNITED STEEL COMPANIES LTD

SP207A

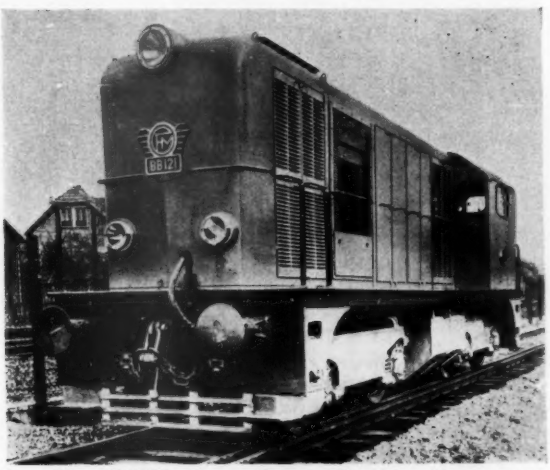
ISOTHERMOS

ISOTHERMOS axleboxes are in the forefront of the technics of railway journal lubrication, having gained THE WORLD SPEED (205 m.p.h.) and ENDURANCE (405,000 MILES) records when fitted to French National Railways Electric Locomotives.

Isothermos modern mechanically lubricated axleboxes of the type Athermos meet all requirements of modern railways.

Due to their robustness, easy and cheap maintenance, the Isothermos axleboxes of either *inside* or *outside* design are ordered in increasing number for the fitting of all types of Diesel Locomotives.

French National Railways: 25 Co Co 120-ton—2,000 h.p. Diesel Electric Locomotives for passenger trains.



Bo Bo 730/935 h.p. Diesel Electric Locomotive "Overseas" type.

450 h.p. Diesel Electric Locomotive fitted with inside Athermos axleboxes.

"Marine CEMFAR" 400 h.p. Diesel hydro-mechanical Locomotive.

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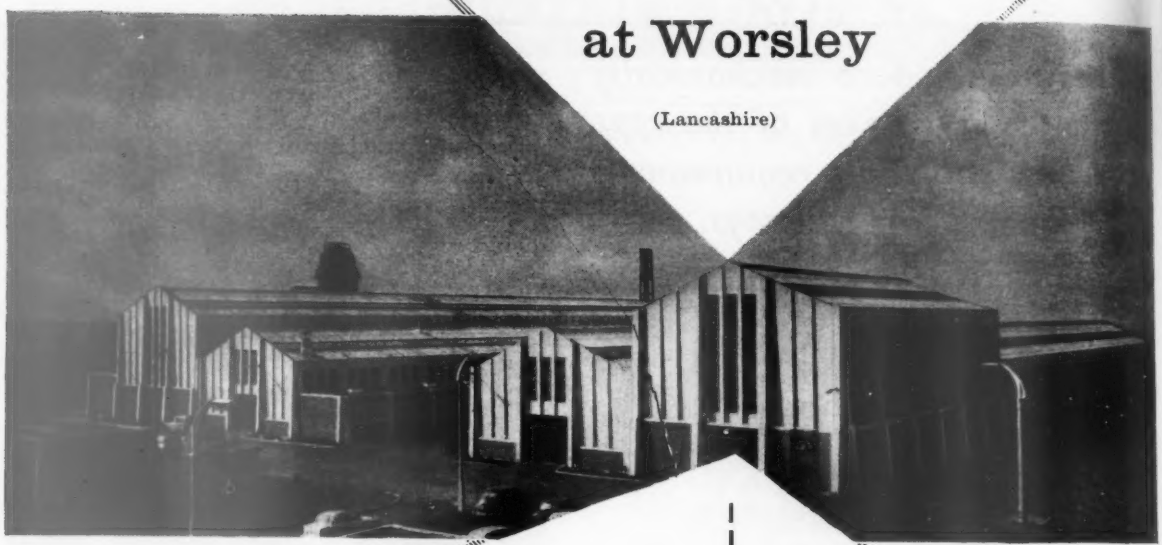
Agents in Great Britain . G. STEPHENSON & CO. LTD., 13 Victoria Street, London, S.W.1

Sole Manufacturers in Great Britain: ROBERT HYDE & SON, LTD. North Stafford Steel Foundry, Stoke on Trent & Clarendon Works, Chesterfield

GRESHAM & CRAVEN
open new brake works
at Worsley

(Lancashire)



These works have been specially planned for production of Vacuum Brake Cylinders and incorporate the most up-to-date equipment and machinery available.

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Designers and Manufacturers of Vacuum Brake Equipment for Railways all over the World.

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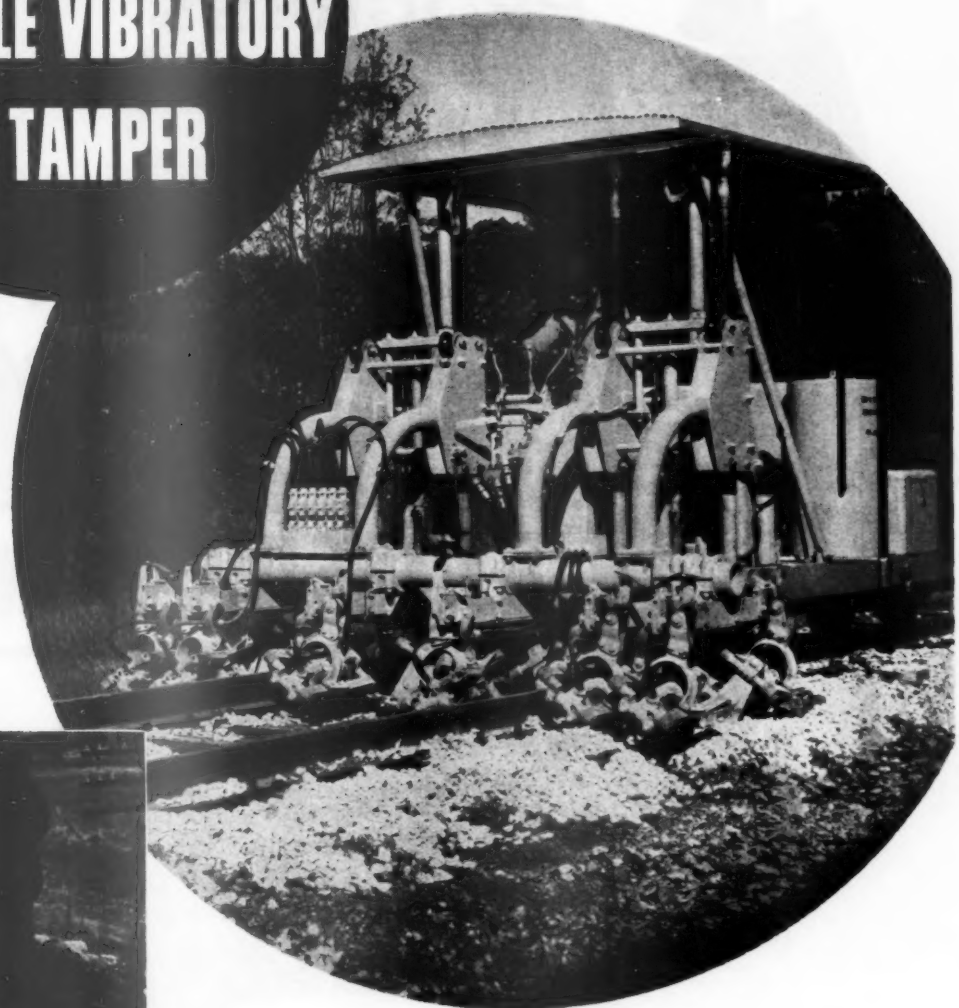
1137

The JACKSON MULTIPLE VIBRATORY TIE TAMPER

Fastest and best means of uniformly tamping railway roadbeds for stable, smooth-riding track in all kinds of ballast . . .



JACKSON MANUALLY GUIDED VIBRATORY TIE TAMPERS

Excellent for major ballasting or out-of-face tamping operations. Any number of these 4-tamper outfits may be grouped as required. Handles are adjustable to suit the convenience of both tall and small operators. Quickly interchangeable blades make them very versatile and permit them to handle every job at peak efficiency. Outstanding favorites in U.S.A. and abroad.

Tamps ballast directly beneath the rail. Quick placement from tie to tie by the touch of a lever, simultaneous, one-hand control of all tampers or one-half of split workhead, interchangeable tamping blades for maximum efficiency on each job, and a 60-second set-off feature make this machine most versatile, fast and efficient. Diesel or gas powered. One of several Jackson tamping machines. Write or wire for details.

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN · U.S.A.

The Name Behind

DIESEL RAIL TRACTION

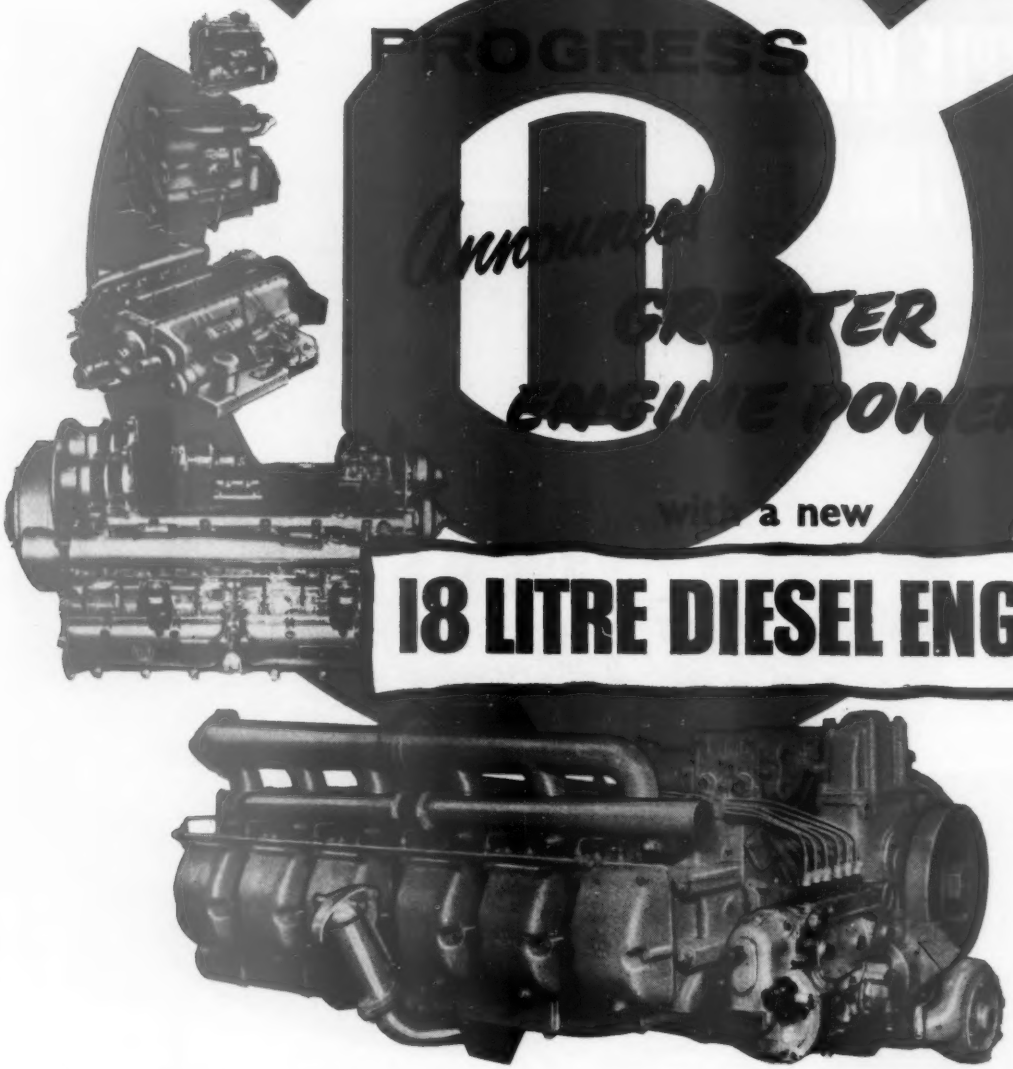
PROGRESS

Announced

GREATER ENGINE POWER

with a new

18 LITRE DIESEL ENGINE



First with Lightweight Diesel Trains incorporating the original 125 b.h.p. diesel power unit, B.U.T. then provided 150 b.h.p. and 200 b.h.p. engines. In 1957 the 230 b.h.p. unit was developed to provide a better power for weight ratio and now even better performance is offered with this 275 b.h.p. engine. In the forefront of rail traction with the improved railcar and railbus power units and controls, B.U.T. confidently forecast greater popularity for this new economical power unit for rail traction.

Engine Type AH 1100

BRIEF SPECIFICATION

NORMALLY ASPIRATED

Max. power . . . . . 275 b.h.p. at 1,900 r.p.m.
Max. torque . . . . . 890 lb. ft. at 1,300 r.p.m.

TURBO-CHARGED

Max. power . . . . . 360 b.h.p. at 1,900 r.p.m.
Max. torque . . . . . 1170 lb. ft. at 1,200 r.p.m.
Capacity. . . . . 1083 cu. in.
Compression ratio 16 to 1.

BRITISH UNITED TRACTION LTD

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comprehensive manufacturing facilities for

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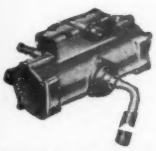

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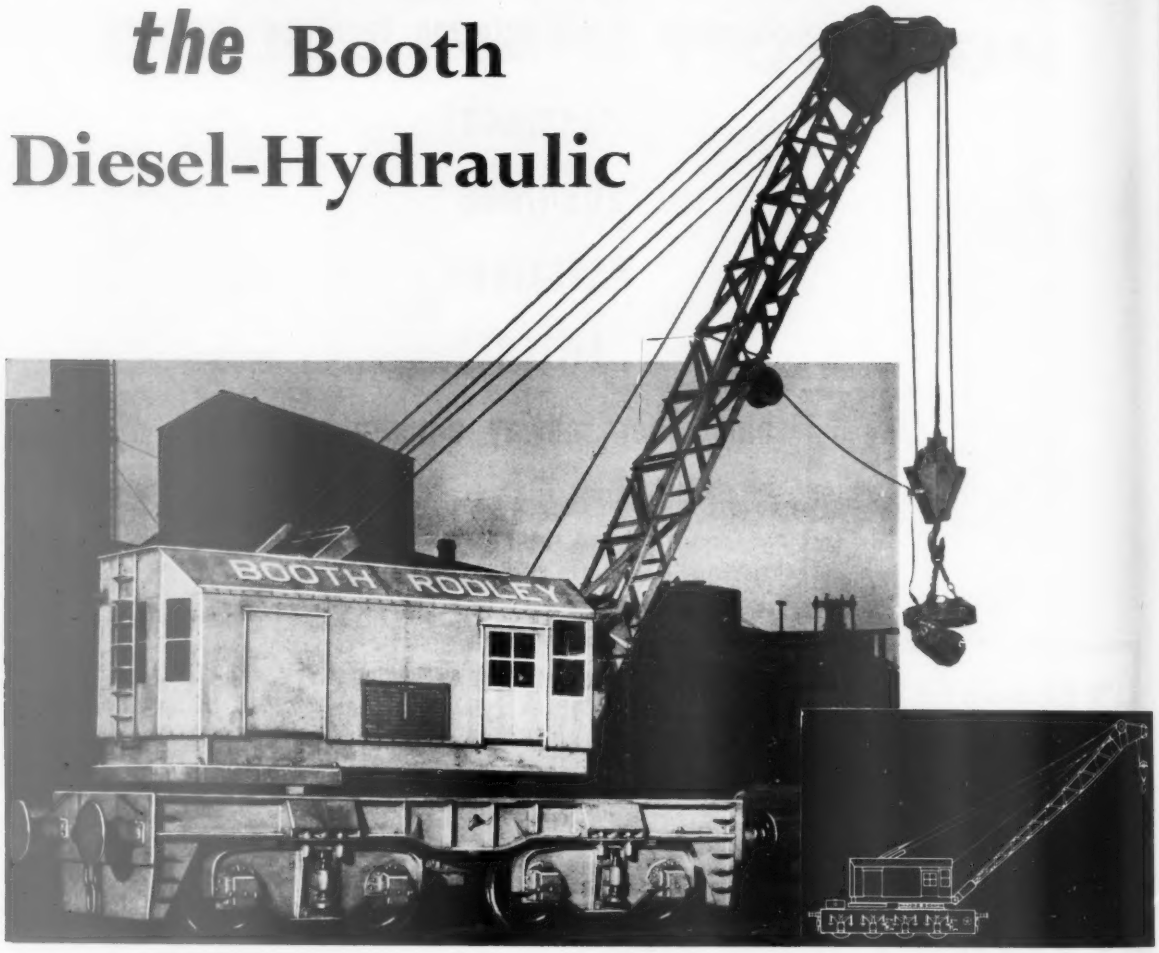
C

A completely NEW rail crane!

the Booth Diesel-Hydraulic



Four axle carriage version for main line railway service

* FEATURING . . . . .

A hydraulic transmission system giving four speeds in either direction on travelling, hoisting and derricking motions

Compressed air controls are provided for quick response and easy operation

The Booth Diesel-Hydraulic Crane is the most up-to-date rail mounted crane in the world and the compact and efficient hydraulic transmission system is one of the most significant developments since the introduction of the Diesel driven locomotive crane.

Demonstrations can be arranged and full details obtained on application to Joseph Booth & Bros., Rodley, Leeds.

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Telephone: Holytown 412 (6 lines) Telegrams: "Clyde," Motherwell

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NO OTHER COMPRESSOR

—piston or rotary—delivers so much air for its size and weight

Compare the difference in size between the VT4 and an average rotary compressor in the 125 c.f.m. range.
125 cfm
160 c.f.m
Atlas Copco

PACKAGED POWER IN THE ATLAS COPCO VT4— THE WORLD'S LIGHTEST 160 c.f.m. COMPRESSOR

The VT4 is over 20% lighter and 25% smaller per c.f.m than any machine, piston or rotary, in its range.

Lighter and smaller than some machines with a free air delivery of only 60 c.f.m.—the VT4 has taken power weight ratios into a new dimension.

Powered by a Deutz diesel engine the VT4 gives an unequalled c.f.m./h.p. ratio, with fuel economies which offer a saving on any contract.

The VT4 is the first of a series based on major changes in design and production methods. For example, it is the only machine with a single welded unit, which incorporates the crankcase, bellhousing and cylinder ducting.

Basic simplicity in design eliminates maintenance and overhaul problems—local mechanics anywhere can service this machine.

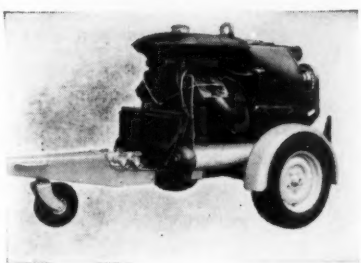
Unscrew one nut and all four valves in the low pressure cylinder can be removed. Loosen three bolts and the complete engine-compressor unit lifts out.

The VT4 is 100% air-cooled—starts on the button and works with equal efficiency anywhere in the world.

The VT4 is easier to load with its low weight and built-in lifting eye—easier to tow with its two wheels and torsion bar suspension.

Manhandling on site is a simple operation with a machine weighing less than 21 cwt. and fitted with a pivoting nose wheel.

All instruments and controls are operated from a central dashboard.



The VT4 is compactly assembled under a canopy which can be completely stripped in a few minutes to give maximum access.

THE NEW VT4

Atlas Copco PUTS COMPRESSED AIR TO WORK FOR THE WORLD

Contact your local company or agent, or write to Atlas Copco AB, Stockholm 1, Sweden

P.16

EVEN IF THEY HAVE TO BE SPECIALLY MADE

We've always said that Unbrako screws cost less than trouble.

But it happens that once in a while a customer needs a screw that cannot be found even in the vast Unbrako range.

So we make them to the customer's own specification, or design specially for him.

And even when we have to make specially, Unbrako still costs less than trouble.

So, rest assured, standard or not, you can always safely specify Unbrako screws and make sure of getting the finest fasteners that are made anywhere in the world. Details of sizes and threads will gladly be sent on request.

UNBRAKO SOCKET SCREW COMPANY LIMITED · COVENTRY

UNBRAKO SCREWS still COST LESS THAN TROUBLE

UNBRAKO

there's the D600 – right on time!

In a sense, well ahead of time, the latest thing in diesel-hydraulic locomotives commissioned by British Railways fully exploits the strength-for-weight advantages of light alloy construction. The locomotive constructors, North British Locomotive Co. Ltd. have employed a cast ALPAX drivers cab and ALPAX castings for doors, windows, louvres and other components. Railways throughout the world specify ALPAX for its superior qualities of strength, lightness, resistance to corrosion and freedom from cracking.

POWER-OPERATED DOORS of all types are available for all applications combining the unique properties of ALPAX or Lightalloys Rigid Foam Filled construction with the established dependability of G. D. Peters operating gear.

ALPAX light alloy castings FOR WORLD RAILWAYS

LIGHTALLOYS LTD ALPAX WORKS ST LEONARDS RD WILLESDEN JUNCTION N W 10

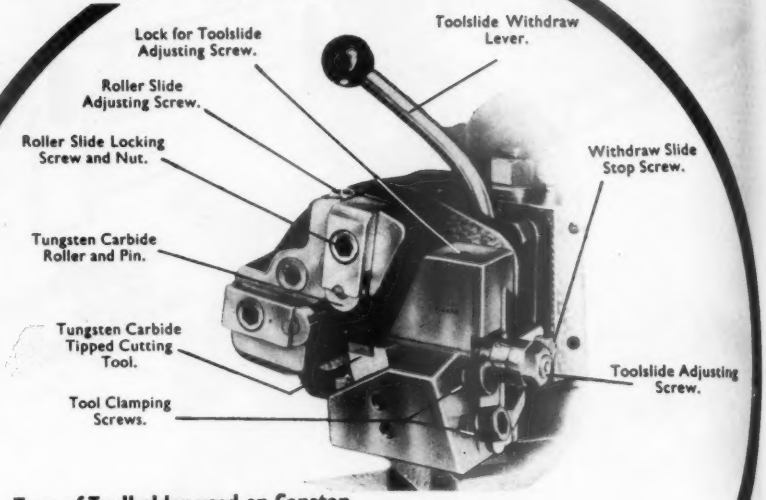
A MEMBER OF THE MANGANESE BRONZE AND BRASS GROUP OF COMPANIES

P1585

For Heavy Cuts at High Speeds

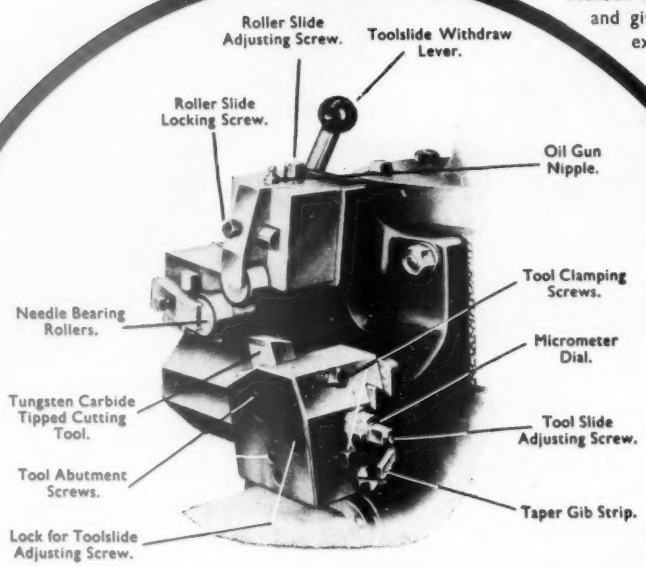
Ward

Tangential Roller Turning Toolholders


Lock for Toolslide Adjusting Screw.
Toolslide Withdraw Lever.
Roller Slide Adjusting Screw.
Roller Slide Locking Screw and Nut.
Withdraw Slide Stop Screw.
Tungsten Carbide Roller and Pin.
Tungsten Carbide Tipped Cutting Tool.
Toolslide Adjusting Screw.
Tool Clamping Screws.

Type of Toolholder used on Capstan Lathes

Toolholders for capstan lathes have long-life tungsten-carbide rollers and pins allowing maximum speeds to be used without danger of seizure and giving the work an excellent burnished finish.



Type of Toolholder for Turret Lathes

Toolholders for turret lathes have rollers mounted on anti-friction needle bearings and the roller slides have provision for oil gun lubrication.

Constructed for use with tungsten-carbide tools, these holders present the tool tangentially to the work in a quickly set robust slide having micrometer adjustment. Tool relief on return stroke obviates marking work.

MOST SIZES FROM STOCK OR EARLY DELIVERY

ASSOC. BRITISH MACHINE TOOL MAKERS LTD

DESCRIPTIVE LEAFLETS ON APPLICATION

H. W. WARD & CO. LTD.

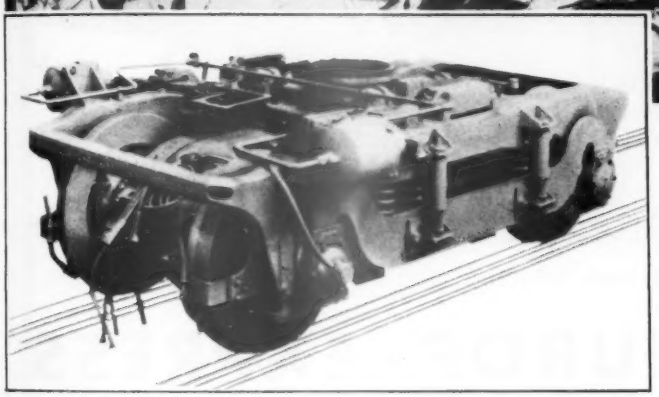
DALE RD., SELLY OAK, BIRMINGHAM 29

W659-1A

Where railroad progress is cast in steel...

FOR DIESEL as well as electric and steam locomotives, General Steel Castings Corporation is the outstanding designer and supplier of one-piece cast steel bogies.

Photographs courtesy General Electric Company



The first order of diesel locomotives for main-line service in the Union of South Africa are equipped with these General Steel 4-wheel equalized swing motion motor bogies.

General Steel's eminence as the supplier of Commonwealth one-piece cast steel products is the result of more than 50 years of designing and manufacturing for the railroads of the world.

General Steel constantly strives to create better designs that meet the needs of today's railroads. Outstanding production facilities permit the manufacture of one-piece cast steel devices that assure long life, dependable performance and low maintenance costs.

Experienced staff engineers of General Steel Castings Corporation and Commonwealth Sales Corporation are available to you for consultation on your equipment operating and engineering problems.

Commonwealth products are furnished completely machined and are designed for all track gauges by

GENERAL STEEL CASTINGS CORPORATION

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Commonwealth products which are now produced under license in Australia, Canada and England, soon will be produced in South Africa.

COMMONWEALTH SALES CORPORATION

International Representatives: **Granite City, Illinois, U. S. A.**

Telegraph: **"Comsteelco"**

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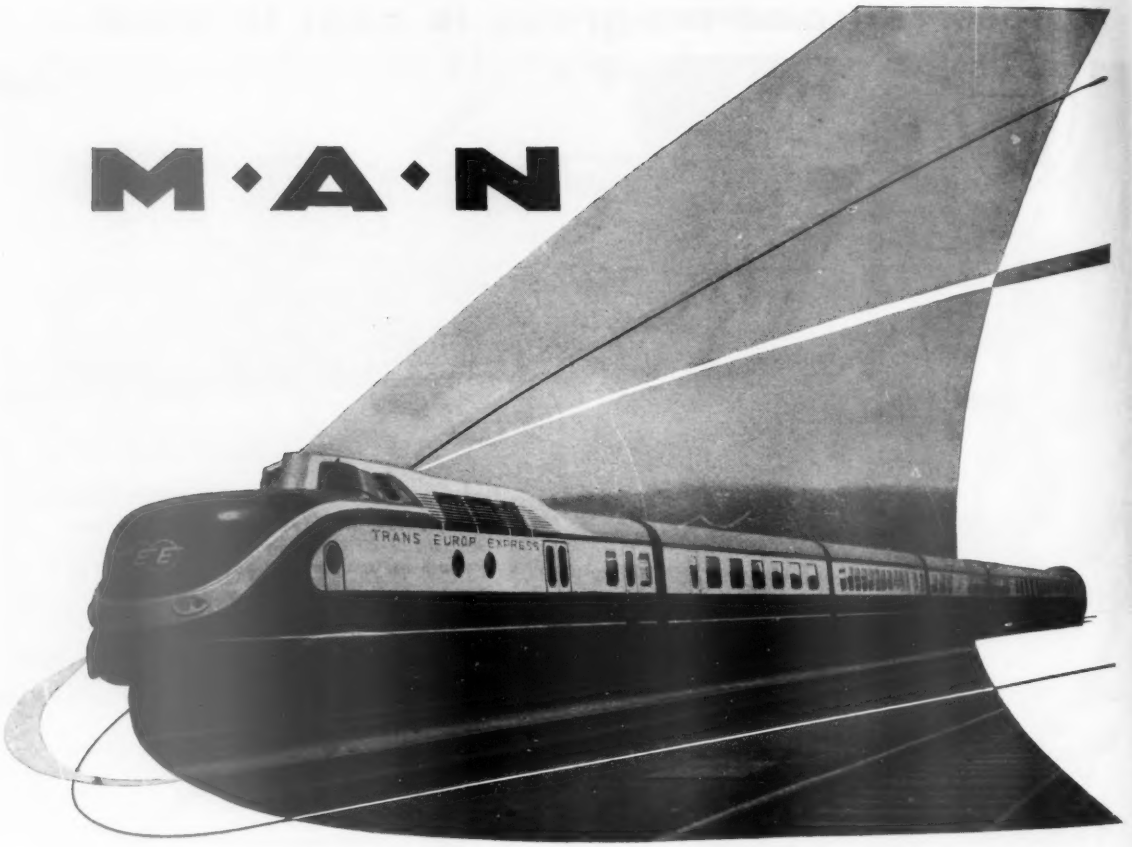

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Streamlined motive power for modern rail transport in the

POWER COACHES

developed and built by

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in co-operation with the German Federal Railways.

Among their outstanding features:

1100 h. p. Diesel-hydraulic traction plant,

450 h. p. Diesel generator for air conditioning, lighting, kitchen facilities and other auxiliary loads,

composite construction with aluminium superstructure on steel underframe - maximum noise insulation,

air-operated disc brakes combined with magnetic rail brake,

automatic train control, deadman control and standard safety equipment for all Continental railways,

suitability for ferry service to Scandinavia,

140 km./hr. max. speed.

R 16249/E

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These completely reliable, unit-type indicator lamps have gained a firm place in transport signalling. One of their most important features is flexibility! Single units are designed for easy multiple mounting or can be supplied to suit any existing system. They can also be supplied with a separate moulded base for shelf fixing.

Indications can be either :—

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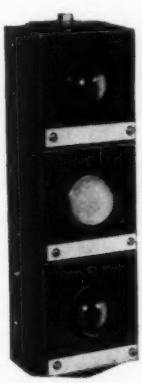
(ii) Stencilled character.
'N', 'R', OFF, ON or numeral, opal white on blue background.

(iii) Bulbous coloured roundel.
Red, Green, Amber or White.

S.B.C. Lamp Holder housing to suit B.S. range of S.L. Lamps.
Approx. weight : 6 ozs.
Size : L. 2⅜in. by W. 2⅛in. by H. 2¼in.



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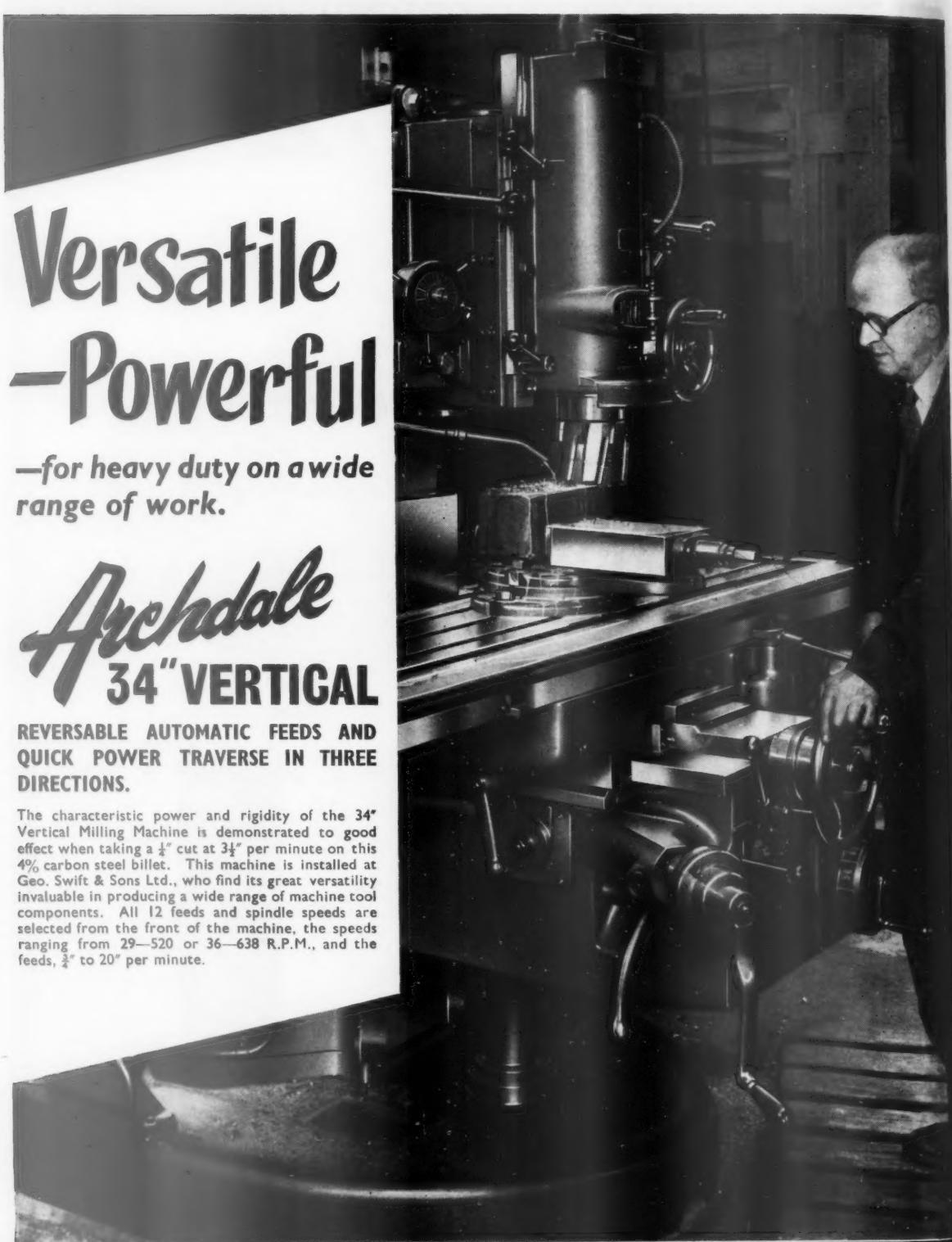
Archdale 34" VERTICAL

REVERSABLE AUTOMATIC FEEDS AND QUICK POWER TRAVERSE IN THREE DIRECTIONS.

The characteristic power and rigidity of the 34" Vertical Milling Machine is demonstrated to good effect when taking a ¼" cut at 3½" per minute on this 4% carbon steel billet. This machine is installed at Geo. Swift & Sons Ltd., who find its great versatility invaluable in producing a wide range of machine tool components. All 12 feeds and spindle speeds are selected from the front of the machine, the speeds ranging from 29—520 or 36—638 R.P.M., and the feeds, ¾" to 20" per minute.



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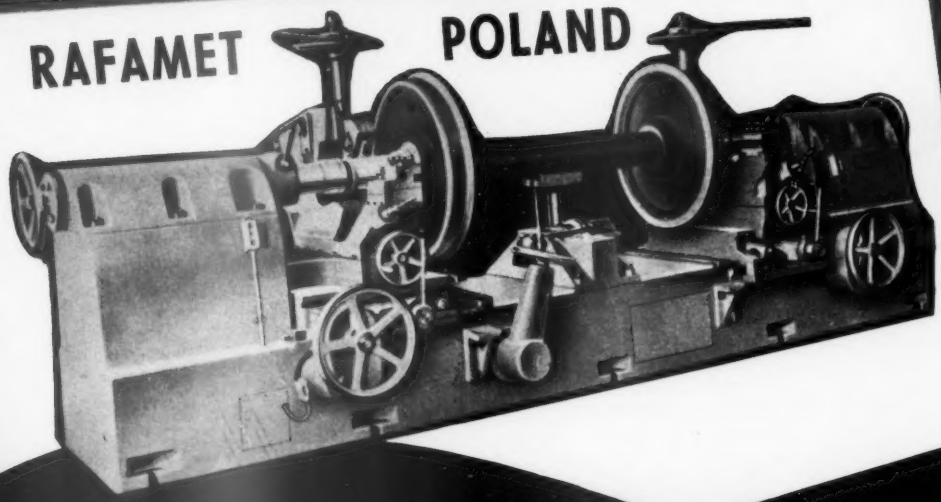

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RAFAMET have long years' experience in the construction of heavy special-purpose machines for railway workshops
RAFAMET supply machine tools for all types of wheel sets
RAFAMET guarantee full and prompt service to their customers
1000 RAFAMET machines are operated in numerous railway workshops and repair shops all over the world

PRODUCTION PROGRAMME

Semi-automatic lathes for machining railway wheel sets
Special boring and turning mills for tyres and wheel centres
Machines for burnishing axle journals and burnishing attachments to be used with universal lathes for machining locomotive piston rods and short shafts
Heavy universal boring and turning mills
Special-purpose machines for the production of axles for wheel sets of all types
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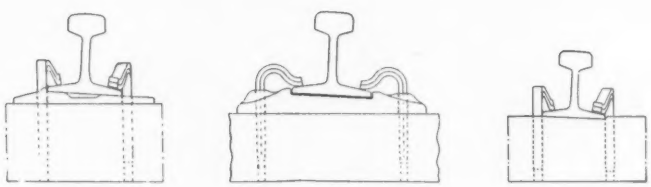
Elastic Rail Spikes give resilience to absorb vertical rail movement. Rail creep is resisted in both directions and track maintenance costs are reduced.

Designs are available to suit existing Track Construction.



Single shoulder baseplate. Double shoulder baseplate. Without baseplate.

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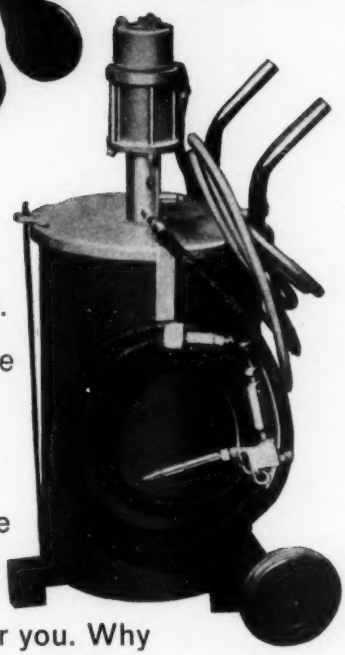
we welcome them

A mobile 50 gallon oil dispenser for rapid and metered sump filling.

A high pressure dispenser capable of being wheeled over uneven surfaces.



This era of increasing productivity has brought with it entirely new engineering techniques and developments. It has presented the lubrication engineer with a whole series of new problems. One of these units may solve your particular problem. If not, we can produce a special lubricator for you. Why not write for one of our specialists to call and discuss your lubrication difficulties. Let us shoulder your worries. We thrive on them.

A 9 gallon pressure unit for spraying detergent mixtures to the undersides of vehicles for the removal of encrusted dirt and grease.

A positive solution for the pumping of heavy and non self-levelling greases.

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ELASTIC SPIKE EXTRACTOR

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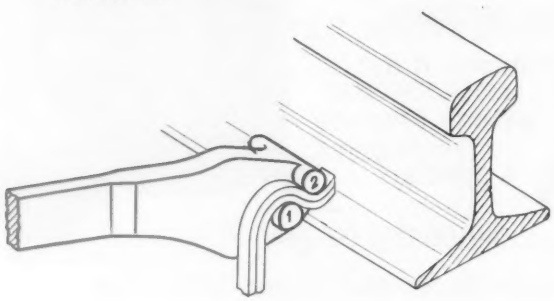
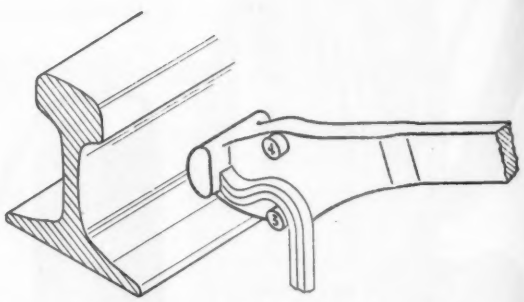
1. The two right hand pegs (marked 1 and 2) are inserted over and under the spike and raising the handle de-tensions the spike and starts the withdrawal.





2. The left hand peg (No. 3) is inserted under the head of the spike and completes the withdrawal.

Peg No. 4 is for the second operation where the spike adjoins a fishplate preventing Peg No. 3 from being inserted. The extractor is turned upside down and pin No. 4 inserted on the side away from the fishplate.

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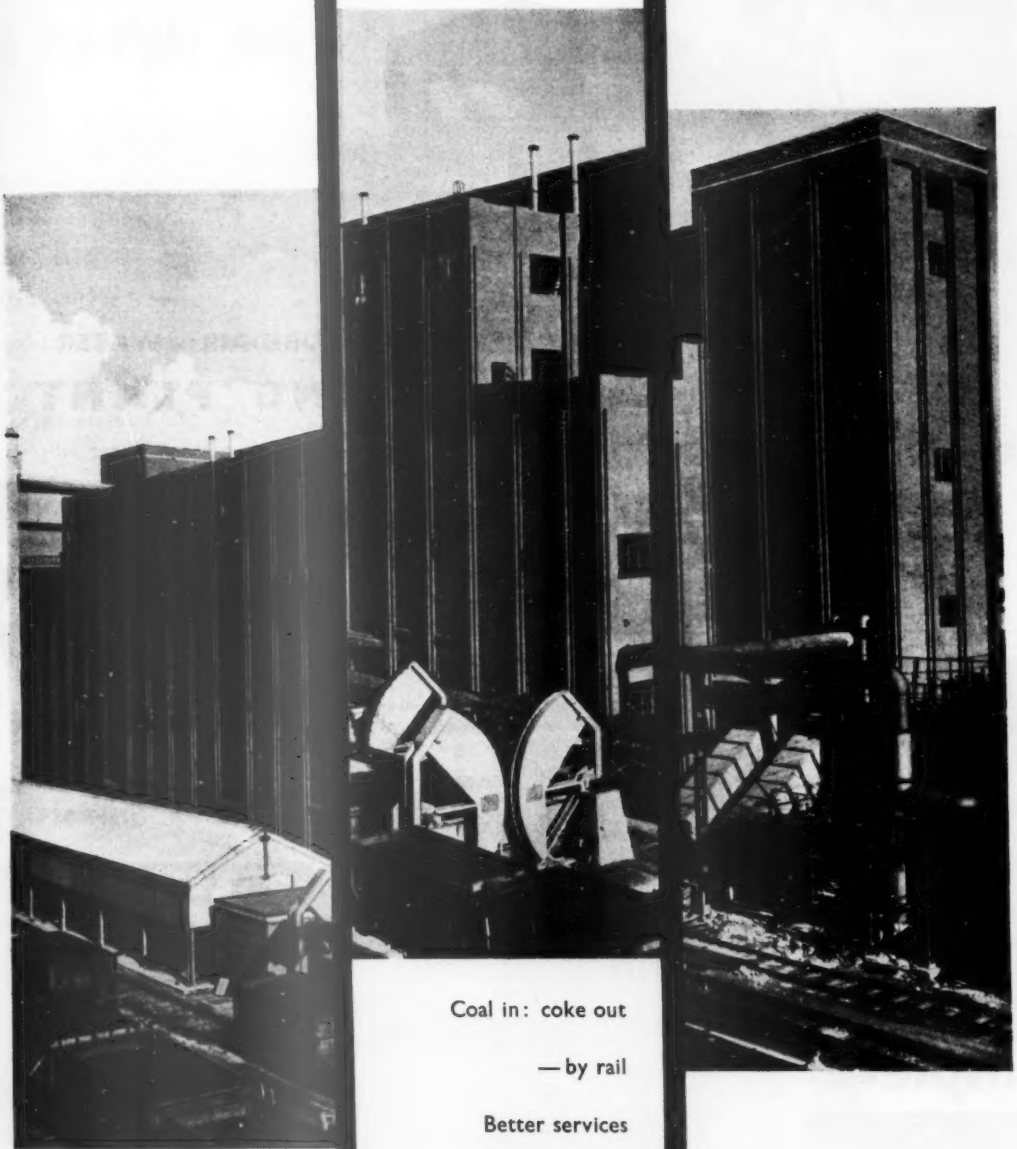

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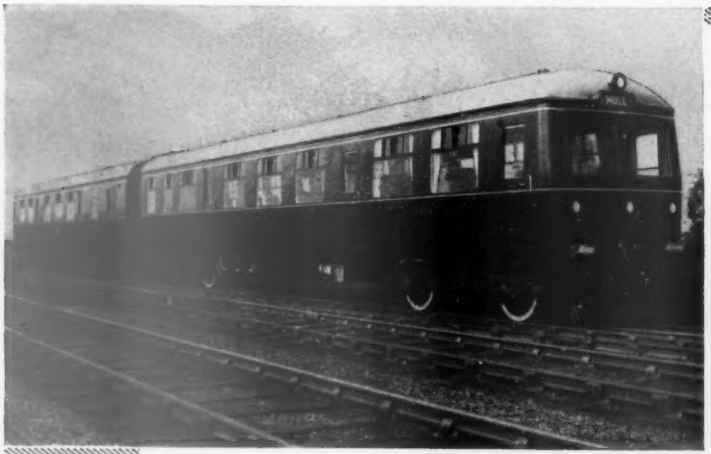

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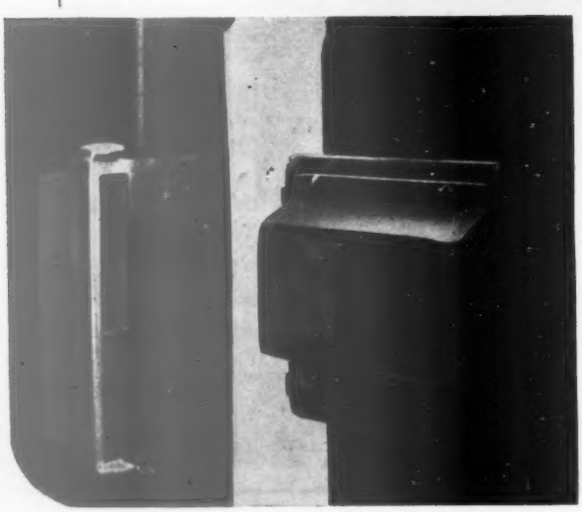

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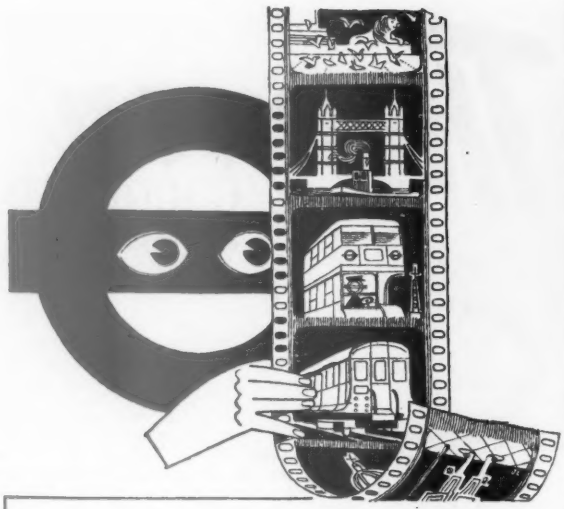

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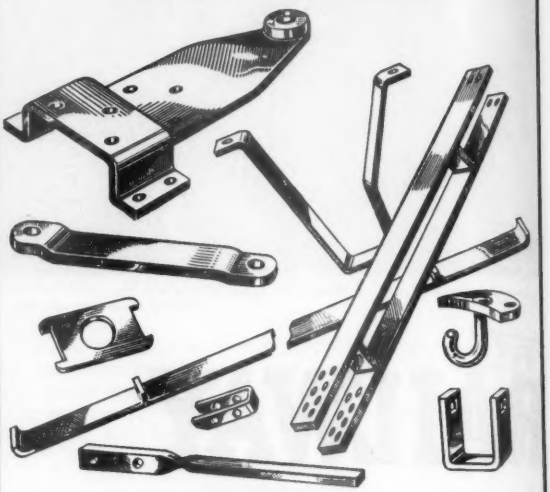

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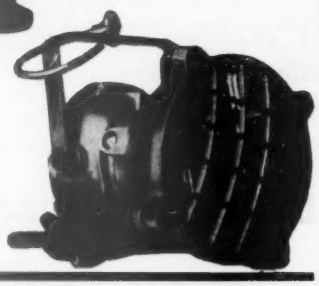

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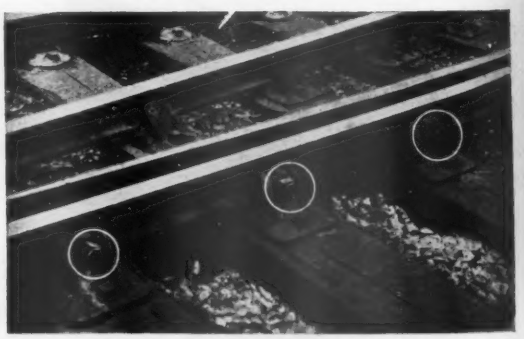

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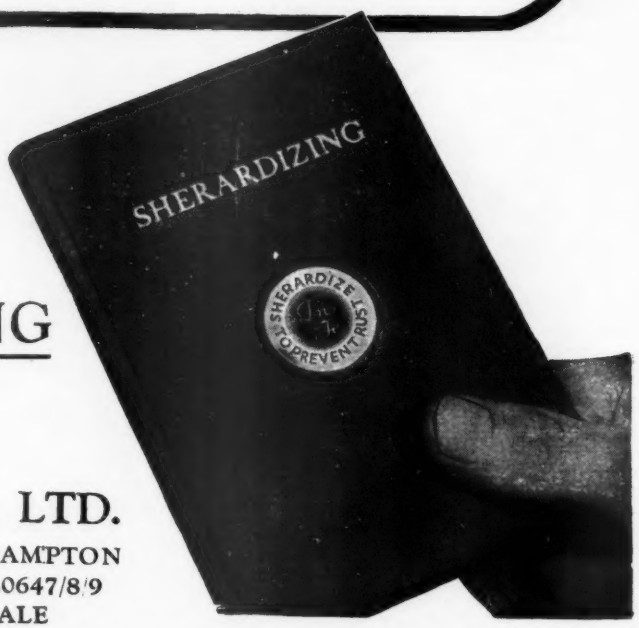

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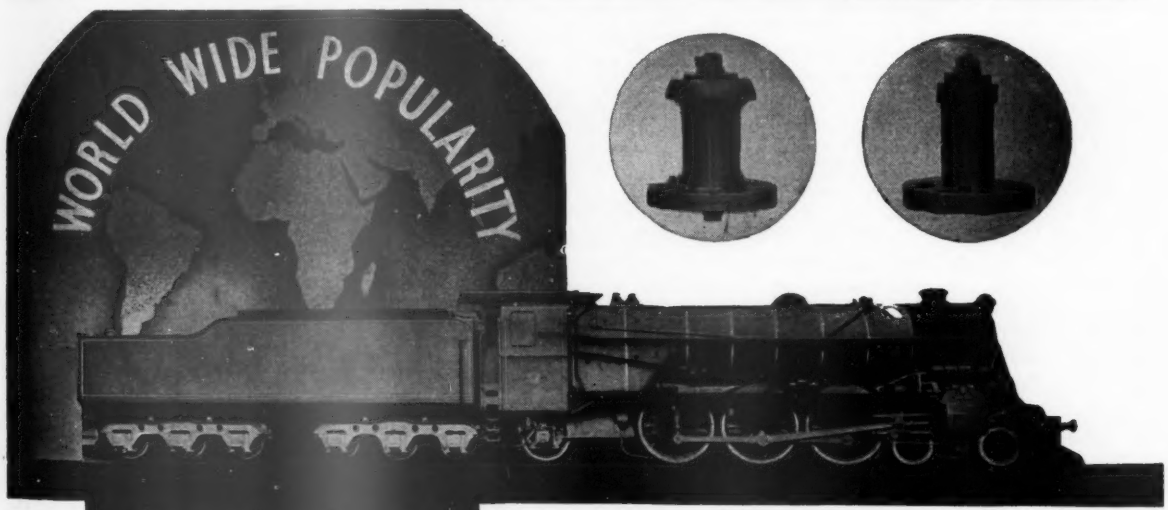

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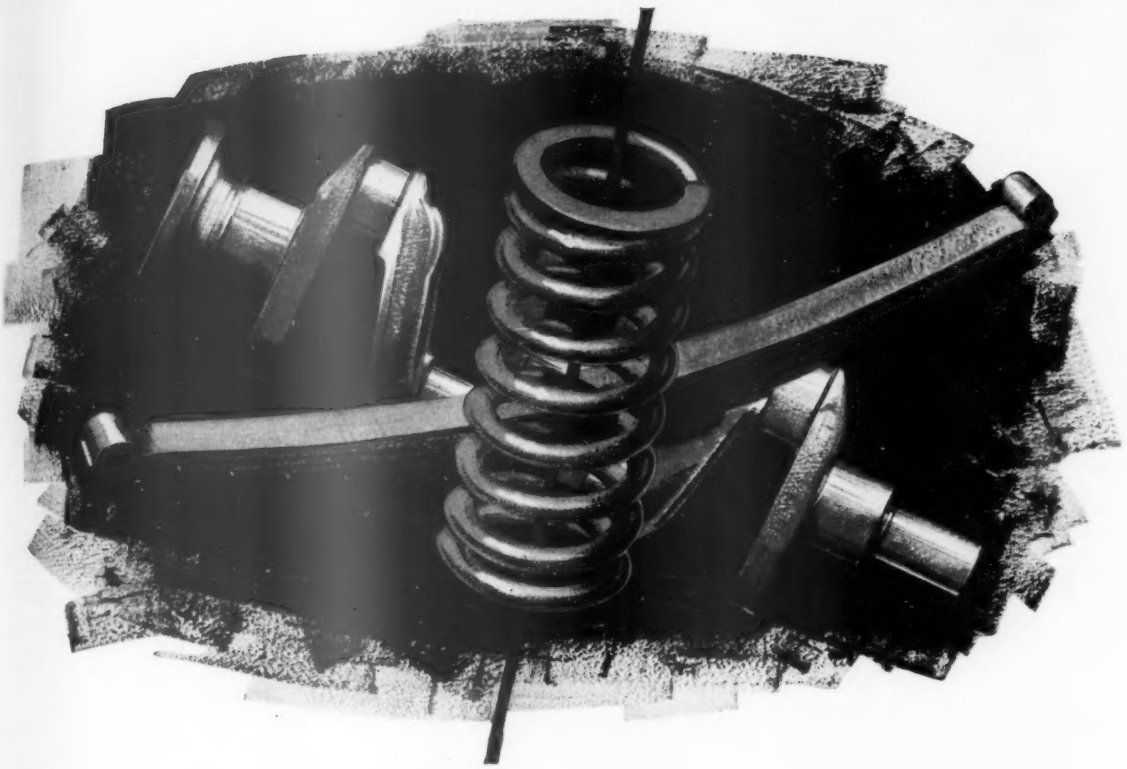

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